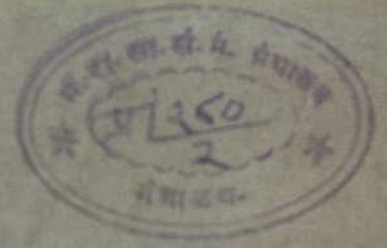


MAHARASHTRA IN MAPS

Author : K. R. DIKSHIT

२६०

२



MAHARASHTRA STATE BOARD FOR LITERATURE
AND CULTURE, BOMBAY

MAHARASHTRA IN MAPS



MAHARASHTRA IN MAPS

Author

K. R. DIKSHIT

Assisted by

Charulata Patil



MAHARASHTRA STATE BOARD FOR LITERATURE AND CULTURE, BOMBAY

First Edition

June 1986

©

Secretary
Maharashtra State Board for Literature and Culture
Mantralaya, Bombay 400 032

Publisher

Shri S. D. Deshmukh
Secretary
Maharashtra State Board for Literature and Culture
Mantralaya, Bombay 400 032

Printer

Manager
Government Central Press
Netaji Subhash Road
Bombay 400 004

Price—Rs. 132

FOREWORD

It is a great pleasure for the Maharashtra State Board for Literature and Culture to publish on the eve of the 25th Anniversary of the formation of the Maharashtra State, a book ' Maharashtra in Maps ' written by Prof. K. R. Dikshit of Poona University. I, on behalf of the State Board for Literature and Culture, am grateful to Prof. K. R. Dikshit for accepting my request to write such a book on Maharashtra and also complete it in a very short time.

I am also grateful to Shri R. B. Alva, Director, Government Printing and Stationery, Maharashtra State, Bombay and his workers for the printing of the book.

S. S. BARLINGAY

Chairman

State Board for Literature and Culture

Bombay

Yashodhan

Bombay

Dated 10th December 1985

CONTENTS

	Page
(i) Preface and acknowledgements	.. (ix)
(ii) List of tables	.. (xi)
(iii) List of maps	.. (xiii)
(iv) Introduction	.. (xvii)
 CHAPTERS	
I The Evolution of the outline of the State of Maharashtra	.. 1
II Prehistoric and protohistoric outline of Maharashtra	.. 12
III Geology and mineral resources of Maharashtra	.. 16
IV Relief and physical features	.. 21
V Drainage network and river valleys	.. 26
VI Climatic conditions	.. 31
VII Soils	.. 38
VIII Forests of Maharashtra	.. 43
IX Landuse and agriculture	.. 52
X Irrigation	.. 66
XI Power resources in Maharashtra	.. 79
XII Industries and industrial development	.. 86
XIII Transport and trade in Maharashtra	.. 94
XIV The people of Maharashtra	.. 104
XV Population	.. 117
XVI Towns and cities in Maharashtra	.. 141
XVII Regions of Maharashtra	.. 152
XVIII The Bombay Metropolitan Region	.. 196
XIX Maharashtra—Retrospects and prospects	.. 211
Appendix	.. 219
Bibliography	.. 233
Index	.. 243

PREFACE AND ACKNOWLEDGEMENTS

The present volume had in its inception a series of maps meant as illustrations to the study of Maharashtra. Following the suggestion from some colleagues, the author undertook writing brief notes as an aid to the appreciation of these maps. The notes grew in length, and gradually, as the work advanced, turned into a book. Thus, 'Maharashtra in Maps' is not only a volume of maps, but also incorporates a text that throws light on many aspects of the land and economy of Maharashtra. Though the quantitative information in the book is derived primarily from documentary sources, the author has leaned in no small a measure, on his observations and the preception of landscape that he developed during the course of his frequent field visits undertaken as a part of his professional assignment. Discussion with the colleagues in the University, and the people in general, strengthened many of the author's ideas, which, not always substantiated, appear as surmises in the book. Despite the initial commitment, it has not been possible for the author to include everything relating to Maharashtra in the book. This is the limitation of most regional works written by a single author. Many aspects of the land and life of Maharashtra were left out either because they were too controversial or lay beyond the competence of the author.

The author has received liberal help from many quarters in the preparation of the manuscript. But there are some whose encouragement and support need to be mentioned. The colleagues from the University department of Geography advised the author on themes ranging from the size of the maps to the inclusion of specific topics, in the book. Equally significant has been the role and contribution of his students, many of whom working on their M.Phil and Ph.D. dissertations, had acquired an intimate awareness of the field situation that proved a great help. Two people who were a constant companion to the author, during the course of his work, are Miss Charulata Patil, the Research Assistant, and Mr. G. D. Walvekar, the Cartographer, both of whom suffered quiet boredom because of the author's insistence on improvement. The author is deeply indebted to them. The typing of the manuscript by Mrs. K. D. Kulkarni, to start with, and subsequently by Mr. N. K. Kulkarni who completed the work in time, was an inducement to the author for further progress. The people who shared his ideas and helped the author by constructive criticism are the author's former students, and now colleagues in the department, V. S. Datye, Jayamala Diddee, S. R. Jog and finally Jutta Dikshit, the last being the better half of the author.

The maps in the volume, mostly thematic, have been drawn on the basis of the latest available data, but some of the maps have been either adopted or reproduced with modifications from other sources. I acknowledge thankfully the framework and sometimes the details I received from these sources. The outline of Maharashtra is based on the Survey of India sources, so also are the maps of drainage, relief and some regional maps. The maps of Geology and minerals is a scale reproduction of the Geological Survey of India map. The maps on Forests are based on National Atlas Maps. The first two maps on history have been borrowed from Dr. D. M. Wagh's thesis—'Geographical influences on the history of Maharashtra' and G. S. Sardesai's 'New History of the Marathas'. Besides, there are some maps which have been adopted from the maps prepared by the various departments of the Government of Maharashtra, like the department of Irrigation, Electricity Board, Department of Agriculture, CIDCO, and Bombay Metropolitan Regional Development Authority. The map on archaeological sites is based on Professor H. D. Sankalia's book, 'Prehistory and Protohistory of India and Pakistan'. The data sources are given in the bibliography, at the end of the book. The author is also grateful to some of his colleagues who read through the relevant chapters and offered very important suggestions.

Dr. A. Deshpande of the department of history, University of Poona, read through the chapter on history. Dr. Usha Bambawalla went through the chapter on 'the people of Maharashtra', and Prof. V. N. Misra of Deccan College helped the author by making available valuable material on the pre and protohistory of the State, going through the text of the chapter and making the required corrections. The author is thankful to them all.

Most important of all, it pleases me to make a mention and express the heartfelt sentiment of gratitude towards Professor Surendra Barlingay, the Chairman of the Maharashtra Board of Literature and Culture. A former Professor of Philosophy, at the University of Poona, known for his scholarastic achievements and intellectual integrity, Professor Barlingay not only gave me valuable advice but also took keen interest in completion and publication of the present book. I thank him heartily and profusely.

Finally the author would like to thank the Maharashtra Board of Literature and Culture for bringing out the book and the Government Central Press, Bombay, for doing a splendid work of printing.

LIST OF TABLES

Sr. No.	Table	Name	Page
1	T-3.1	Composition of basalt after Karkare	17
2	T-3.2	Composition of basalt after Washington	17
3	T-3.3	Coal reserves in Maharashtra	19
4	T-3.4	Manganese production in Maharashtra	20
5	T-4.1	Location and height of some peaks in Western Ghats	22
6	T-5.1	River basins and their areas in Maharashtra	26
7	T-5.2	Length, Catchment area and discharge of some rivers in Maharashtra	30
8	T-8.1	Forest areas owned by different agencies in Maharashtra	47
9	T-8.2	Maharashtra—Forest produce, their value and volume	50
10	T-8.3	National parks, wild life sanctuaries and forest parks in Maharashtra	51
11	T-9.1	Land utilization in Maharashtra	52
12	T-9.2	Acreage of different crops in Maharashtra	57
13	T-9.3	Trends of area and production of certain crops in Maharashtra	59
14	T-9.4	Yields of some principal crops in Maharashtra	60
15	T-10.1	Area irrigated by sources in Maharashtra	66
16	T-10.2	Distribution of tanks for irrigation in Vidarbha	70
17	T-10.3	Changes in the area under sugarcane and wheat in Maharashtra ...	72
18	T-10.4	Variation in area irrigated in Maharashtra from 1952 to 1975 (by crops).	72
19	T-10.5	Percentage of area irrigated under different crops	73
20	T-10.6	Irrigation potential of some early irrigation works in Krishna basin ..	77
21	T-11.1	Installed capacity for the generation of electrical power in Maharashtra	79
22	T-11.2	Share of different power generating agencies in the State	80
23	T-11.3	Installed power generating capacity in Maharashtra in March 1982	83
24	T-12.1	Number of factories in Maharashtra	88
25	T-12.2	Share of different groups of industries in the total output of Maharashtra	93
26	T-13.1	Road length in Maharashtra	96
27	T-13.2	National highways and their lengths in Maharashtra	96
28	T-13.3	State transport routes and distances travelled	97
29	T-13.4	Length of railways in different districts of the State	100
30	T-14.1	Religious composition of the population of Maharashtra	105
31	T-14.2	Population of some important tribes in Maharashtra	112
32	T-15.1	Population variation from 1901 to 1981 in Maharashtra	117
33	T-15.2	Religious composition of population of India and Maharashtra	131
34	T-15.3	Age-sex composition of Greater Bombay, Thane and Pune	133
35	T-15.4	Growth of rural and urban population in Maharashtra	134
36	T-15.5	Distribution of inhabited villages in different size-groups in 1971 (Maharashtra).	134
37	T-16.1	Urbanization in Maharashtra : Urban population and number of towns	143
38	T-16.2	Size distribution of towns in Maharashtra	144
39	T-16.3	Number of towns and their shares of urban population in different size-groups.	144
40	T-18.1	Industrial areas and industrial units in the metropolitan region outside Greater Bombay.	203
41	T-18.2	Population growth of Greater Bombay and other towns in Bombay Metropolitan area.	204

LIST OF MAPS

	..	Page
1. (1) India in 1561, To-day's Maharashtra, an over-lay (2) The Kingdom of Shivaji (3) The Growth of Maratha Empire under Shivaji (4) Maratha Empire in 1758 A.D.	..	3
2. (1) The Coastal Powers of the Konkan—1680 (2) The Coastal Powers of the Konkan—1700 (3) Important Forts of Western Maharashtra (4) India in 1805	..	4
3. (1) Bombay Presidency—1911 (2) Bombay Province—1941 (3) Bombay, Saurashtra and Kutch States—1951 (4) The Bi-Lingual Bombay State—1956	..	8
4. Maharashtra—Administrative Divisions	..	9
5. Maharashtra Pre and Early Historic sites (1) Lower Palaeolithic (2) Middle and Upper Palaeolithic sites (3) Chalcolithic Sites (4) Early Historic Sites	..	13
6. Maharashtra—Geology and Minerals	..	18
7. Maharashtra—Relief	..	23
8. Maharashtra—Drainage	..	28
9. Maharashtra—Monthly Temperatures—Maximum, minimum and mean <i>(a)</i> Isotherms—January <i>(b)</i> Isotherms—June	..	33
10. Maharashtra Rainfall <i>(a)</i> Drought-prone areas	..	34
11. Maharashtra—Water budget	..	35
12. Maharashtra—Soils	..	40
13. Maharashtra—Forest—Distribution (Natural Types) <i>(a)</i> National Parks, Forest Parks and Wild Life Sanctuaries	..	45
14. Maharashtra—Forest Distribution—Categories according to legal status <i>(a)</i> Forest areas in sq. km.	..	48
15. Maharashtra—Percentage of area under Forests (Talukawise)	..	49
16. Maharashtra—Landuse (Districtwise)	..	54

	Page
17. Landuse Categories	55
(1) Percentage Fallow Land	..
(2) Percentage of other Uncultivated Land excluding Fallow Land	..
(3) Percentage of area not available for cultivation	..
(4) Percentage of area under Forests	..
18. Maharashtra—Crop pattern	58
19. Maharashtra—Distribution of Crops	61
(1) Pulses	..
(2) Groundnut	..
(3) Cotton	..
(4) Sugarcane	..
20. Maharashtra—Distribution of Crops	62
(1) Jowar	..
(2) Bajra	..
(3) Rice	..
(4) Wheat	..
21. Maharashtra—First Three Crops in Each District	63
22. Maharashtra—Percentage—Area sown (Talukawise)	64
(a) Intensity of Cropping	..
= $\frac{\text{Area sown more than once}}{\text{Net sown area}} \times 100$	..
23. Maharashtra—Major and Medium Irrigation Projects	68
24. Maharashtra—Irrigation by different sources	69
25. Maharashtra—Area Irrigated under Different Crops	71
26. Maharashtra—Major Power Generating Stations	81
(a) Table	..
27. Maharashtra—Power Generation and Transmission	84
28. Maharashtra—Industries	87
(a) Pune	..
(b) Bombay	..
29. Maharashtra—Factories and workers	90
(a) Greater Bombay	..
30. Sugar Factories in Maharashtra—1978-79	91
31. Factories and workers in Maharashtra	92
(1) Cotton, wool, silk and synthetics	..
(2) Machine-tools, Machinery and appliances	..
(3) Chemicals, Rubber and Plastic Chemical Products	..
(4) Metal Products and Transport Equipment	..
32. Maharashtra Transport Net	95
(a) Bombay-Thane	..
33. Maharashtra—Places of tourist interest	98

	Page
34. Coastal navigation—Passenger and goods traffic ..	101
35. Maharashtra—Percentage of Scheduled Caste Population—1971 (Talukawise)	110
36. Maharashtra—Scheduled Tribes Percentage of total population (Talukawise) .. (a) Distribution of Different Tribes	111
37. Maharashtra—Percentage of people speaking languages other than Marathi as their mother tongue.	114
38. Languages other than Marathi spoken as mother tongues—Hindi, Gujarati, Kannada and Telugu.	115
39. Maharashtra .. (1) Rural Population—1961 (2) Urban Population—1961 (3) Density of Population—1961 (4) Percentage of Variation in Population 1951-1961	120
40. Maharashtra—Rural Urban Population—1971 .. (a) Greater Bombay (b) Poona city	121
41. Maharashtra—Distribution of Rural Population—1971 ..	122
42. Maharashtra—1971—Degree of Urbanization (Talukawise) ..	123
43. Maharashtra—Population Density—1971 ..	124
44. Age and Sex Pyramid—1971 .. (a) Maharashtra—Age and Sex Pyramid	125
45. Maharashtra—Occupational structure .. (a) Greater Bombay Occupational structure	126
46. (1) Maharashtra—Population—1981 .. (2) Density of Population per sq. km.—1981 (3) Increase in Population—1971-1981 (4) Towns with 100,000 or more Population and Decennial change in Population.	127
47. Maharashtra—Rural Population—1981 ..	128
48. Maharashtra—Density of Population—1981 .. (a) Percentage Variation in Population—1971-1981	129
49. Maharashtra—Population Growth—1901-1981 .. (a) Maharashtra (b) Greater Bombay	130
50. Maharashtra—Population in Different Size Village Groups—1971 ..	135
51. Maharashtra—Cumulative Frequency curves of settlements and population in settlement of different size groups.	136

	Page
52. Maharashtra Growth of Towns ..	145
(1) 1931 — (a) Bombay	
(2) 1941 — (a) Bombay	
(3) 1951 — (a) Bombay	
(4) 1961 — (a) Bombay	
53. Towns of Maharashtra—1971 ..	146
54. Towns of Maharashtra—1981 ..	147
55. Regions of Maharashtra ..	154
56. North Konkan, Tapi Valley, Upper and Middle Godavari and Upper Bhima Valley	156
57. South Maharashtra—Konkan, Sahyadri, Krishna Valley ..	161
58. Marathwada—Bhima Valley ..	168
59. Eastern Maharashtra—Wardha-Wainganga Valley, Vidarbha-Purna Valley, Middle Godavari Valley	189
60. Bombay—Physical setting—Greater Bombay and its environs ..	198
61. City of Bombay with CBD ..	199
62. Bombay Metropolitan Region—Growth of individual towns ..	200
63. (a) Population density in Greater Bombay ..	201
(b) Slum areas in Greater Bombay	
64. Bombay Metropolitan Region and New Bombay—Landuse ..	206
65. Trends of crop production ..	208
66. Trends of population growth ..	209
67. Production and employment in important industries ..	210

INTRODUCTION

The present volume incorporates the features of both, a book as well as an atlas, with as many as one-third of its pages devoted only to maps, and the remaining two thirds to the discussion of the land, economy and the people of Maharashtra. The idea originally was only to prepare a volume of maps, and hence the title 'Maharashtra in Maps'. The text was added subsequently not only to encompass a wider area of the contemporary situation, but also to help the reader better appreciate the maps. The balance between the maps and the text is not always even, and some themes are covered with far too many maps than the others. This has resulted from a variable quality and quantity of available data and source material. The attempt has been to present as balanced a picture as possible of the physical, economic and cultural landscape of Maharashtra.

The idea in writing this book is to present, to the layman and the enlightened section of the society alike, a volume that could impart some basic understanding of Maharashtra. The treatment and the discussion in the book is simple with almost no technical jargon. Controversial statements have been avoided though it is likely that some of the opinions expressed in the text may not conform to those of the readers. The maps presented in the volume have been prepared from a statistical base obtained from authentic sources and every effort has been made to make them representative. The author would, nonetheless, suggest that the readers do not look for an interpretation of every map, or alternatively a map on every theme discussed in the volume. The maps present a broad quantitative picture and do not depict every thing that is in the book. The text, if confined only to the interpretation of maps, would be truncated and lifeless. Thus, there is only a broad correspondence between the maps and the text in most parts of the book.

The contemporary scene has been emphasized at every step, giving often a historical background. The statements are factual or observational, and, at places, represent the opinion of the author. No effort has been made to advance remedies to problems facing the State. Thus, the book is not a report. The opinions expressed in the book are exclusively of the author and do not reflect the views of the publisher. There is no discussion in the book on the political set-up of the State.

The physical landscape, the human mosaic and the industrial development of the State are followed in the book by a region-by-region account that synthesises the significant physical, economic and socio-cultural attributes of the areas imparting them, in the process, a distinct personality. A chapter on Bombay Metropolitan Region, factual and non-controversial is appended at the end, projecting in bare outlines, the problems of this great metropolis.

The place names in the text appear orthographically inconsistent and the author feels guilty about it, but this has resulted, firstly from a transliteration of Marathi into English, but no less because of the variety of sources from where these are borrowed, like the Survey of India maps, Census reports, Progress reports of the State Government or Statistical handbooks. It is hoped that the readers will not find it too inconvenient.

The book does not pretend to be a very comprehensive account of Maharashtra, nor does it purport to serve as a research monograph. It may, nonetheless, contain suggestions, or germs of ideas for research. The author was genuinely concerned with acquainting the readers with as many aspects of Maharashtra as possibly he could and would feel gratified and consider the purpose of writing this Book well achieved, if the readers develop a basic notion of contemporary Maharashtra after going through it.

K. R. DIKSHIT

CHAPTER I

THE EVOLUTION OF THE PRESENT STATE OF MAHARASHTRA

The State of Maharashtra as is known today did not figure very much in history. The area was variously known as Maharatta country, Deccan or after the component units governed by different rulers. Thus, in the second century B.C., the region or atleast part of it formed a part of the Ashokan empire. Thereafter, Maharashtra was ruled by Satavahanas with their capital at Paithan. After about 4 centuries of stable rule of the Satavahanas, the region passed into the hands of 'Vakatakas', who were displaced by Chalukyas in the 6th century A.D. The Chalukyas with their capital at Badami, ruled over the erstwhile territory of Maharashtra from 6th to 8th century A.D., though during part of the 6th and 7th century, northern Maharashtra was under the control of Kalchuris and the southern Maharashtra was ruled by the Rashtrakutas. The latter finally took control of the entire territory of Maharashtra and were its rulers till the 10th century A.D. The Rashtrakutas were a secular people and protected the followers of all religions and encouraged art and architecture. The famous rock-cut temple of Kailash near Aurangabad was carved under their patronage. A second dynasty of Chalukyas, better known as 'Later Chalukyas' wrested power from the Rashtrakutas, and defeated the 'Parmars' who came from north of Narmada, the Silharas who ruled over northern Konkan and the Cholas who waged a constant war of attrition against them. Two more dynasties which ruled parts of Maharashtra in 12th and 13th centuries were the 'Kalchuris' and the 'Silharas'. And it was a branch of Silharas who ruled over south Maharashtra with their capital at 'Karad'.

The Advent of Muslims

The most well known dynasty that ruled Maharashtra before the Muslims penetrated into the south was that of the 'Yadavas'. They had their capital at Deogiri, modern Daulatabad. At the height of their glory, the Yadavas not only controlled the territory of Maharashtra but also ruled over parts of Andhra Pradesh, Madhya Pradesh and what is known today as Karnatak. One of the Yadavas, Ramchandra, extended the bounds of his empire, but the Yadav glory did not last long, and Deogiri, the capital, was invaded by Sultan Alauddin Khilji in 1294 and Ramchandra had to surrender.

By 1318, the muslim rule in Maharashtra was firmly established and the region began to be ruled by the Sultans of Delhi. The Sultans ruled over Maharashtra, more appropriately Central Deccan, for over 30 years. One of the most notable events of this period was the transfer of the capital from Delhi to Daulatabad in A.D. 1329 by Sultan Mohammad Tughlaq.

The Bahmanis

The administrative disorder and inadequacy of effective control by Mohammad Tughlaq from Delhi coupled with royal feuds created a situation in which there was a virtual power vacuum in the south. This situation was exploited by Hasan Gangu, one of the chieftains at Daulatabad and subsequently named Alauddin Bahman Shah, who proclaimed himself the king of the South, independent of the Delhi Sultanate, in 1347. He expanded his kingdom occupying parts of Andhra Pradesh and Karnatak, and shifted his capital from Daulatabad to 'Gulberga'. The succession of kings that ruled the Bahmani empire, after Bahman Shah, annexed the neighbouring Hindu kingdoms, notably the Vijayanagar empire. The expansion of the empire necessitated a change in the spatial relationship between the capital and the adjacent territory. Consequently, the capital was further shifted from Warangal to Bidar. The Bahmani empire, however, could not remain intact for long and disintegrated into four independent kingdoms viz. the kingdom of Bijapur, Golconda, Ahmadnagar, Bidar and Berar (1538). Of these the 'Imadshahi' of Berar was shortlived and it was merged into Nizamshahi. The Nizamshahi Sultanate of Ahmednagar, in turn, was partitioned and annexed into the Moghul territory of the Deccan and the Adilshahi of Bijapur.

The Rise of Shivaji

At the time when most Hindu kings and jagirdars in western India owed allegiance to either one or the other of the Bahmani States or to the Moghul emperor at Delhi, Shivaji, the son of a Maratha Chieftain, in the employ of the Adilshahi Sultan of Bijapur, developed an independent Kingdom by

occupying some parts of the Moghul territory and annexing some of the Bijapur Sultanate. He declared himself a 'Raja' at Raigad in 1674, of an independent state. His kingdom, small though it was, extending only over four or five districts, was symbolic of self rule. Shivaji called it 'Swarajya', though it was very different from the Tilak's concept of 'Swarajya' or the modern idea of democracy. It was 'Swarajya' in the sense that the land of Marathas was reigned by one of the Marathas, and there was no longer any imposition from an outside power. Shivaji represented the dominant faith, the Hinduism, and was symbolic of resistance that the region offered to Muslim domination of the country.

The Kingdom of Shivaji extended beyond the confines of the present day Maharashtra. He had effective control over western Maharashtra and patches of territory in Karnatak and Tamilnadu. The fringe areas of this territory and some of the important forts frequently changed hands, and the army of Aurangzeb marched through his territory without establishing any rule. What appears surprising is that the battles were fought more for the control of a fort rather than a territory, and the capture of a fort was symbolic of the occupation of its hinterland. The strategic significance of the dissected terrain was well appreciated by Shivaji and he captured, restored and built a large number of forts, invariably located atop prominences commanding important approaches and river valleys. From these forts, his lieutenants not only watched the movements of the enemy and mounted pre-emptive attacks, but also took shelter when faced with a grim situation of facing a large overpowering army, much superior in number and equipment. Thus, the forts occupy a very special place in Maratha history particularly those associated with the daring attacks, victory and occasional escapes of Shivaji.

Raigad, the capital of Shivaji, not so much a capital city in the traditional sense one might imagine, but the fortified top of a hill detached from the main plateau by a river, does not have easy access, and requires not only miles of movements exposed in the valleys but also a steep climb. The hill located about 25 Km. north of Mahad, seems to have been chosen by Shivaji not so much for an efficient administration of his territory as for reasons of defence, almost impregnable, surrounded by hilly terrain and providing forest covered escape route westward in case of an offensive from any power from the Deccan plateau. The successors of Shivaji after his death (1680) did not, indeed could not, expand the empire and found it hazardous to retain control of even the inherited territory. His first son 'Sambhaji' died in the captivity of Aurangzeb, and a weakened Maratha Kingdom was ruled by Rajaram, Shivaji's second son (1689-1700), and subsequently by his queen Tarabai (1700-1707). The last of the Chhatrapatis in the line of Shivaji, Shahu, his grandson and son of Sambhaji, was released by the Moghul King Aurangzeb in 1707 and was installed by a group of Marathas as the Chhatrapati at Satara. This brought in royal intrigues for succession, since another Maratha group wanted another minor grandson of Shivaji, the son of Rajaram, to ascend the throne. It must be emphasized here that the independent and sovereign state of the Kingdom established by Shivaji came to an end with Shahu's acceptance of a vassal status of Aurangzeb.

The decline of the Chhatrapatis, both in their strength and status, *vis a vis* the Moghuls, and the death of Aurangzeb in 1707, created not only unstable political conditions but led to increasing dependence of the Chhatrapati on his advisers and supporters in the Maratha fold who were themselves none-too-united. The Chhatrapati Shahu, personally unequal to the task of reconciling different view points and administering the territory with the necessary statecraft, determination and strength, delegated his powers to his Prime Minister, Balaji Vishwanath, the first Peshwa, who gradually usurped the kingdom, became, in due course, all too important and started ruling as a Peshwa, an office, which he manoeuvred to make hereditary.

The Rise of Peshwas and the expansion of the Maratha empire

The Peshwas who ruled in succession from Poona, though the seat of the Chhatrapati was at Satara, expanded the empire which reached its zenith in 1750. Of the three Peshwas who ruled the Maratha empire, viz. Balaji Vishwanath, Bajirao I (1720-1740) and Balaji Bajirao (1740-1761) before the battle of Panipat, Bajirao I was most able both as an administrator and a statesman. As a soldier he enjoyed the confidence and admiration of his army and reorganized the empire by appointing chieftains for different regions.

In a span of about fifty years after the emergence of the Peshwas on the scene, the Kingdom that Shivaji had founded grew into an empire which extended far beyond his Kingdom and covered practically half of India. The Marathas were then the mightiest power in the country. Most Indian kings owed allegiance to them, and even the Moghul emperor at Delhi was a pawn on their political chess board.

Fig. 1

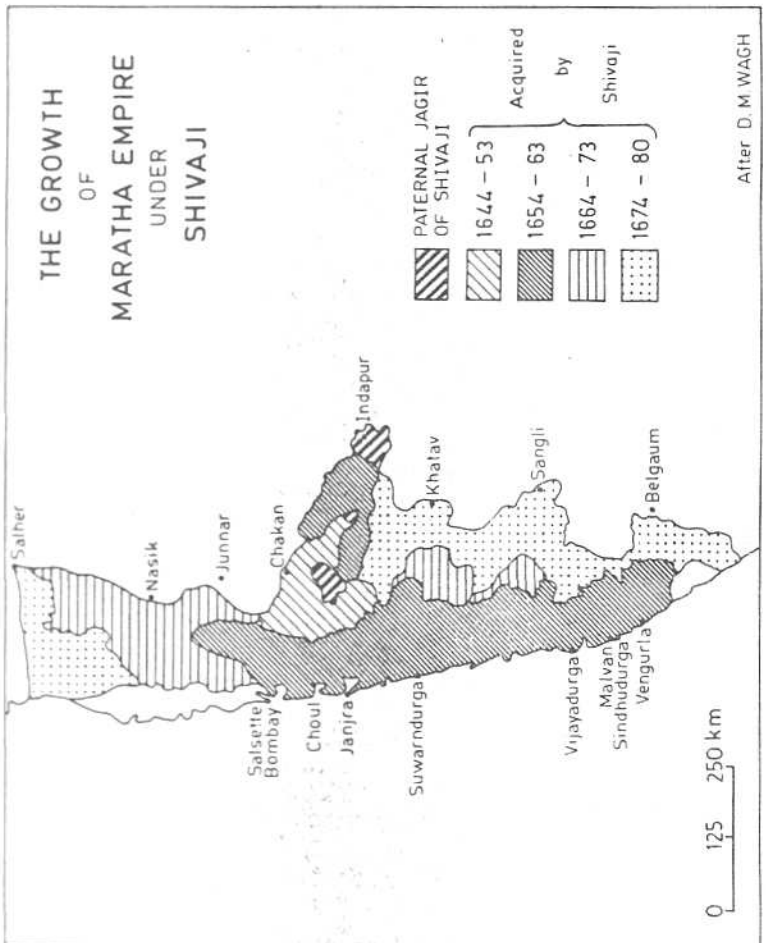
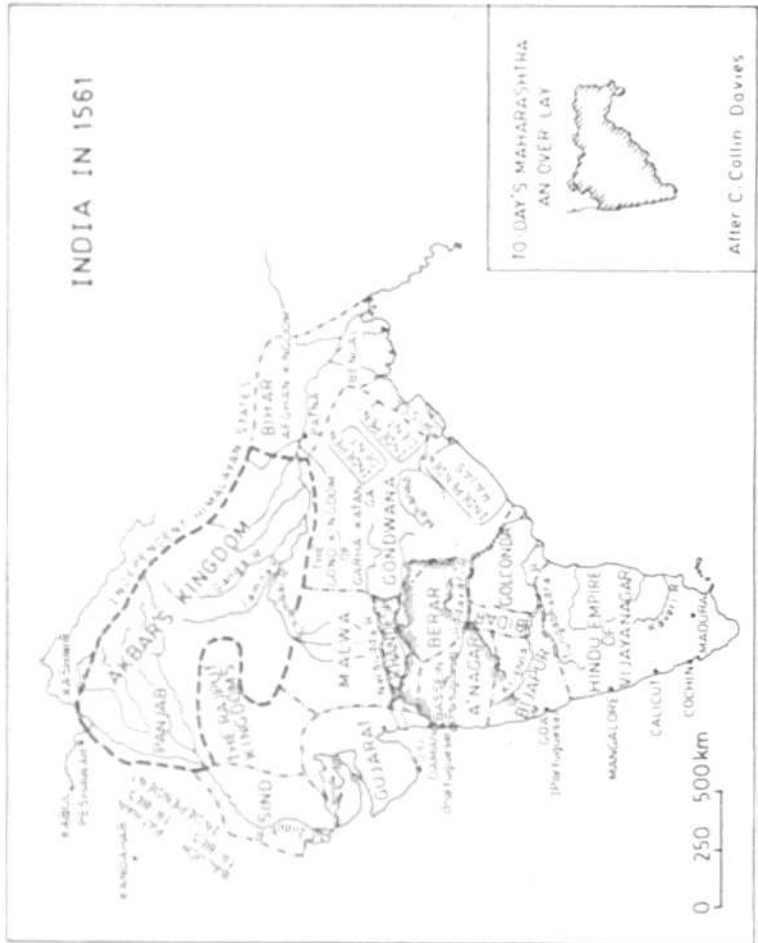
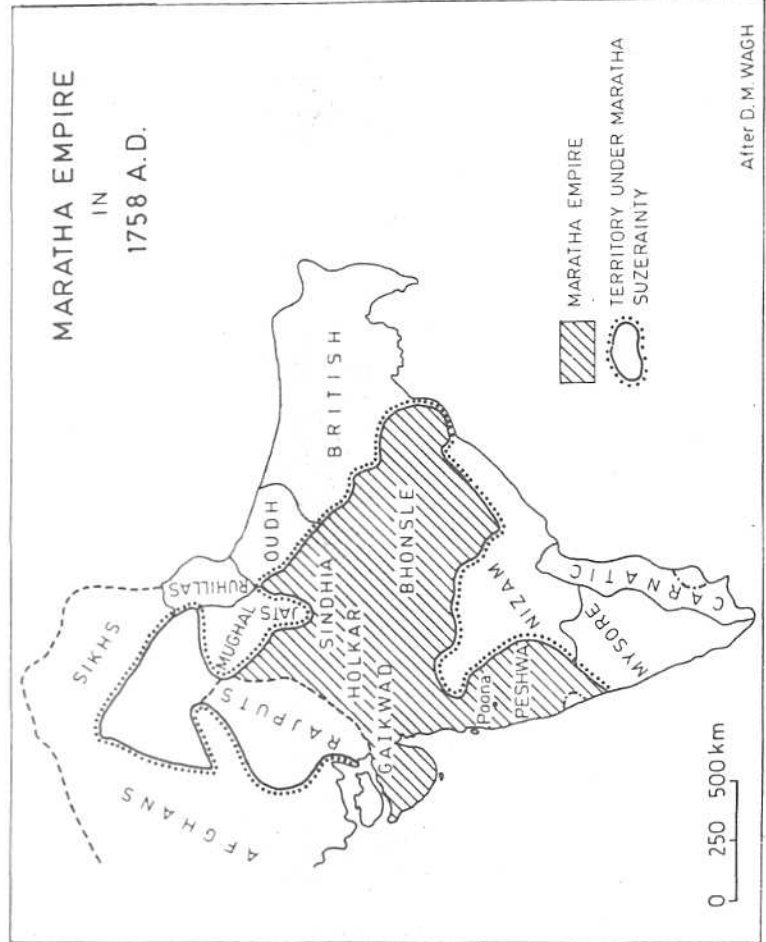
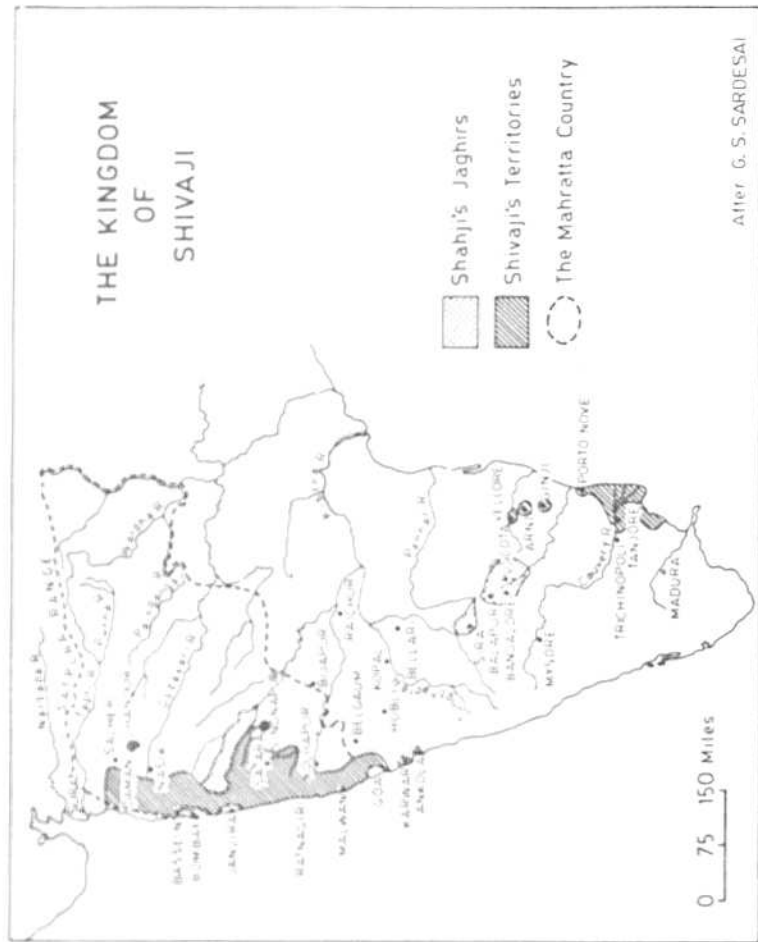
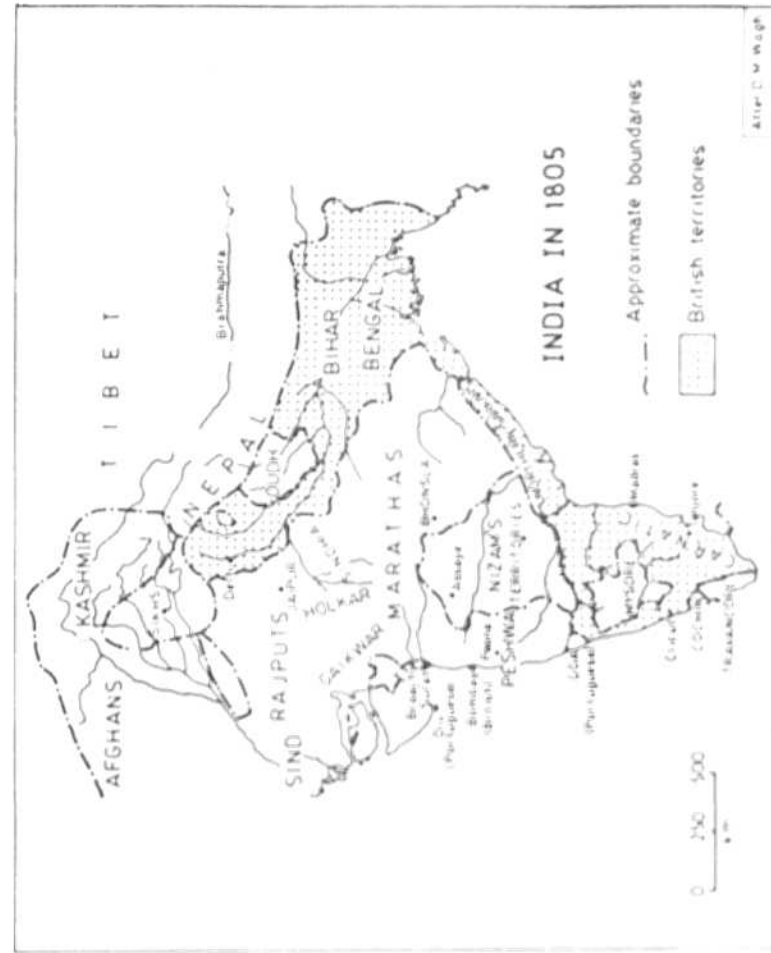
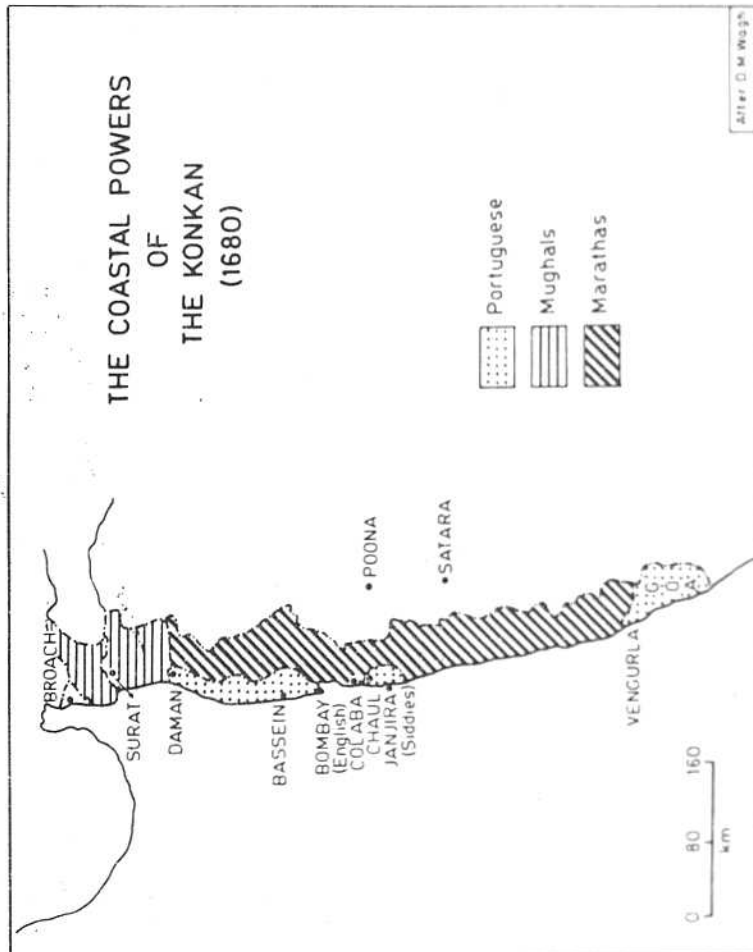
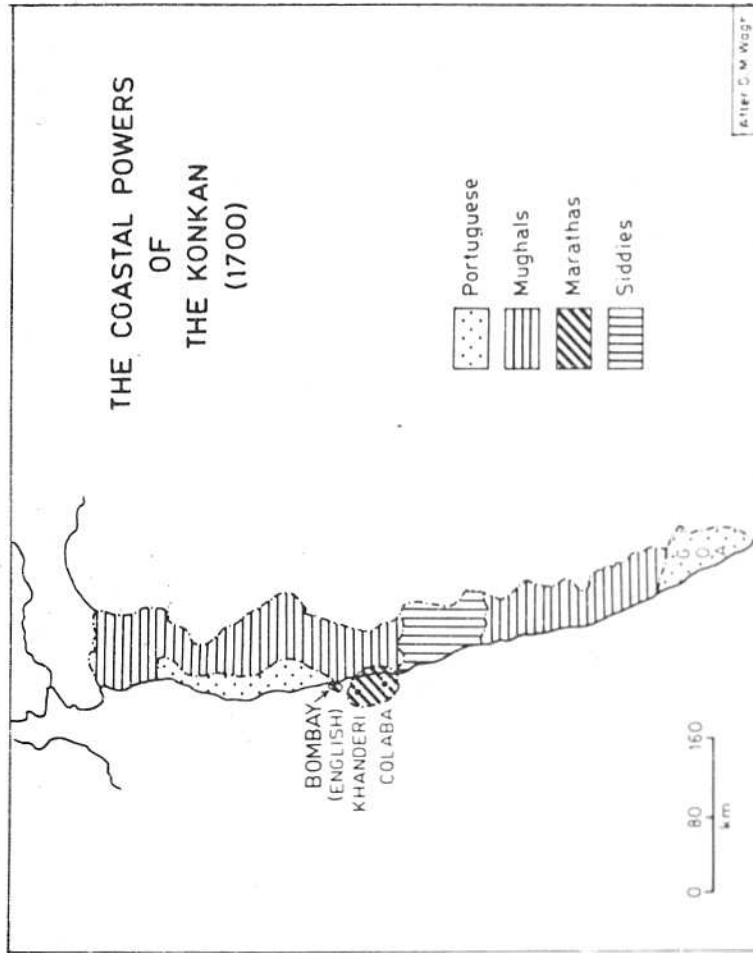


Fig. 2



The battle of Panipat and the decline of Maratha power

The battle of Panipat which the Marathas fought and lost against Ahmad Shah Abdali of Afghanistan in 1761, was a great blow to their prestige, besides being a tremendous loss of manpower, triggering off at the same time internal feuds and cracks in the political organization of their empire. Fortunately, the Marathas had a homeland to retreat thousands of miles away, where they could still re-organize and regroup themselves. But coupled with this disaster was the rise of the English on the West Coast of India and the growing independence of the Maratha chiefs stationed at Gwalior, Indore and Baroda, who were often at war with each other, and in due course aligned with, and accepted the authority of the English. The Peshwas offered resistance, but being isolated from the rest of the Maratha chieftains had to submit in 1818, and the Maratha empire came to a sad end.

The British accepted many of the Maratha chieftains as feudatory kings, declared their Jagirs and estates as agencies, controlled and supervised their affairs through an agent, appointed by them, and made them subject to overall control of the Governor General of India. Thus, in the nineteenth and twentieth century, a large area of the state of Maharashtra as it exists today, formed part of the Bombay presidency which included the British districts and the princely states.

The changing map of Maharashtra

After the British left India in 1947, and the country declared itself an independent sovereign republic, the old British provinces continued for some time. The princely states—about 700 of them were merged into the Indian union, and existed as distinct states of lesser importance, the part 'B.' and 'C.' states, under a Rajpramukh who was usually a prince of the most important state in that region. This was only an *ad hoc* arrangement, and a re-organization of the states, on the basis of the language of the people, bringing in its wake the much debated linguistic states, was ushered in, in 1956. This involved a great deal of change in the established boundaries and the transfer of territory from one province to the other. More importantly, this created a number of new states and remodelled the existing ones where the core areas remained the same but substantial border adjustments were effected. Thus Rajasthan, Karnatak, Kerala emerged as altogether new states, whereas Maharashtra and Gujarat, were carved out of the old Bombay province. The process of the formation of the linguistic states did not end in 1956, but continued, as some states, notably Punjab and Bombay, were still bilingual. A subsequent bifurcation of these bilingual states produced some more states. Thus, the present state of Maharashtra was born on 1st May 1960, as was also the state of Gujarat, both of which formed part of a larger bilingual Bombay state between 1956 and 1960.

Organization of Maharashtra during the British rule.

The British territory in western India was initially grouped under a single administration, and the province was known as Bombay presidency which covered an area of 186,923 sq. miles, and included twenty-five districts grouped under four administrative divisions, the northern, the central, the southern and the Sind, each under a Commissioner, with their headquarters located at Ahmedabad, Poona, Belgaum and Karachi. Bombay was administered by a Collector. Even Aden, including Sheikh Othman and Perim island, was a part of Bombay presidency. Each of these divisions had six districts, besides Bombay city and a bifurcated Khandesh district. The princely states varied in size and population. Many of the small 'Jagirs' and states were grouped together and made larger entities like Kathiawar, Rewakantha and Mahikantha agencies or southern Maratha Jagirs. The larger and more important of these were looked after by political officers whereas the small estates were administered by the collectors of the districts. The feudatory Chiefs ruled 34 per cent of the total area of Bombay presidency.

For purposes of administration the Presidency was divided as follows:—

Sind Division	14. Ratnagiri
1. Hyderabad	15. Kanara
2. Karachi	Deccan
3. Larkana	16. Ahmednagar
4. Sukkur	17. Khandesh east
5. Thar and Parkar	18. Khandesh west
6. Upper Sindh Frontier	19. Nasik
Gujarat	20. Poona
7. Ahmedabad	21. Satara
8. Broach	22. Sholapur
9. Kaira	Karnatak
10. Panchmahals	23. Belgaum
11. Surat	24. Bijapur
Konkan	25. Dharwar
12. Thana	26. Bombay city
13. Kolaba	

The Bombay province.—With the creation of a separate state of Sindh, the Presidency was truncated and it was named Bombay province. The remaining part of the Presidency was organized into British districts and groups of princely states. The latter were named as Western India States agency, comprising the states of Saurashtra, the Gujarat States Agency and the Deccan States Agency. Concurrent with the transfer of power from the British Crown (1947) to the people of India and the partition of India into two countries, India and Pakistan (1947), the province of Sindh became a part of Pakistan.

A very important event that took place in the political history of India at the time of the transfer of power, was the option given to the princely states, through the instrument of accession, either to join India or Pakistan, or to remain independent in conformity with the wishes of the people. Most Indian states willingly joined the Indian union, and a few that remained were cajoled into doing so, and before 1950, most princely states became an integral part of India. For about a decade, the princely states were grouped into part B and C states, depending upon their importance and the size of the territory, with a Rajpramukh, usually the prince of the most important state, as their head. These states were done away with in 1956 with the linguistic reorganization of the states, and were either merged into a linguistic state or were brought at par with other states.

Thus, in 1947, the province of Bombay shrank to a small size and its northern borders were occupied by two more states, the state of Saurashtra and the state of Kutch. The states of Bombay, Saurashtra and Kutch were formed out of the areas given below :—

Bombay State.—The twenty districts of the former province of Bombay, the Gujarat and Deccan States agencies, the Sabarkantha agency (Banas and Sadra divisions) of the former West India States agency, the state of Baroda and parts of Idar, Radhanpur, Vijaynagar, Palanpur and Danta, Abu district, and Abu road and Dilwara tehsils of the former Sirohi state, and the enclave villages of Rajasthan, Saurashtra and Hyderabad, transferred to Bombay. Some of the villages of Bombay state were transferred to Rajasthan and Saurashtra.

Saurashtra State.—The former Western India Agency excluding Sabarkantha agency (Banas and Sadra divisions) and parts of the former Indian states of Idar, Radhanpur and Vijaynagar and Adhoi Mahal of the former Morvi state, and some villages of Bombay state were transferred to Saurashtra. Some of the villages of Saurashtra were also transferred to Bombay.

Kutch State.—Consisted of the former state of Kutch and Adhoi Mahal of the former Morvi state.

In the process of the merger of the princely states and the emergence of two more states viz. Saurashtra and Kutch, fourteen new districts appeared, eight of them in Bombay, five constituting the state of Saurashtra and one constituting the one district state of Kutch. These were Banaskantha, Sabarkantha, Mehsana, Baroda, Amreli, Dangs, Satara south (now Sangli) and Kolhapur in Bombay; the districts of Halar, Madhya Saurashtra, Zalawad, Gohilwad and Sorath, in Saurashtra, and the district of Kutch in Kutch.

In 1951, the state of Bombay had, in all, 28 districts. These were as follows :—

- | | |
|--|--|
| 1. Greater Bombay | 15. Nasik |
| The following present district of Gujarat | 16. Ahmednagar |
| 2. Banaskantha | 17. Poona |
| 3. Sabarkantha | 18. Satara North |
| 4. Mehsana | 19. Satara South |
| 5. Ahmedabad | 20. Kolhapur |
| 6. Kaira | 21. Sholapur |
| 7. Panch Mahals | 22. Thana |
| 8. Baroda | 23. Kolaba |
| 9. Broach | 24. Ratnagiri |
| 10. Surat | The following present districts of Karnataka |
| 11. Amreli | 25. Kanara |
| 12. Dangs | 26. Dharwad |
| The following present districts of Maharashtra | 27. Belgaum |
| 13. West Khandesh | 28. Bijapur |
| 14. East Khandesh | |

The area and population of Bombay, Saurashtra and Kutch States as enumerated in 1951 were as follows:—

	Sq. miles	Persons
Bombay State ..	111,434	35,956,150
Saurashtra State ..	21,451	4,187,359
Kutch State ..	16,724	567,606

The linguistic organization of the States and Bilingual Bombay.—The creation of a large number of part A, B and C states after 1947 was an *ad hoc* step, and the Indian policy makers decided to reorganize the states on the basis of language, meaning thereby that the contiguous areas where majority of the people speak a common language could be incorporated in single state. On this basis, many new linguistic states like Kerala, Karnatak and Andhra Pradesh (the latter already existed when the reorganization of states was taken up in 1956) emerged. The principle of linguistic organization was only partially followed in case of Bombay. While the districts of the adjoining states, where majority of the people spoke Marathi, were added in Bombay, the state was kept bilingual including even the Gujarati speaking areas. Territorially, this coincided with the areas of the present day Maharashtra and Gujarat.

During the process of reorganization, the states of Saurashtra and Kutch were merged into Bombay and so also a few districts from the erstwhile Central provinces and Hyderabad which had become a separate state after the merger of the Nizam territory in the Indian Union. The eight districts of Madhya Pradesh, that were added in Bombay, included Nagpur, Bhandara, Chanda, Wardha, Amravati, Yavatmal, Akola and Buldhana. The districts carved out from Hyderabad state and added to Bombay were Aurangabad, Bhir, Parbhani, Osmanabad and Nanded. Thus thirteen new districts were added to bilingual Bombay state. While the addition of these areas meant a considerable extension of Bombay state into India's heartland, there was some truncation from the south. The four dominantly Kannada speaking districts, viz. Belgaum, Dharwar, Bijapur and North Kanara, part of Bombay State till 1956, were transferred to Karnatak.

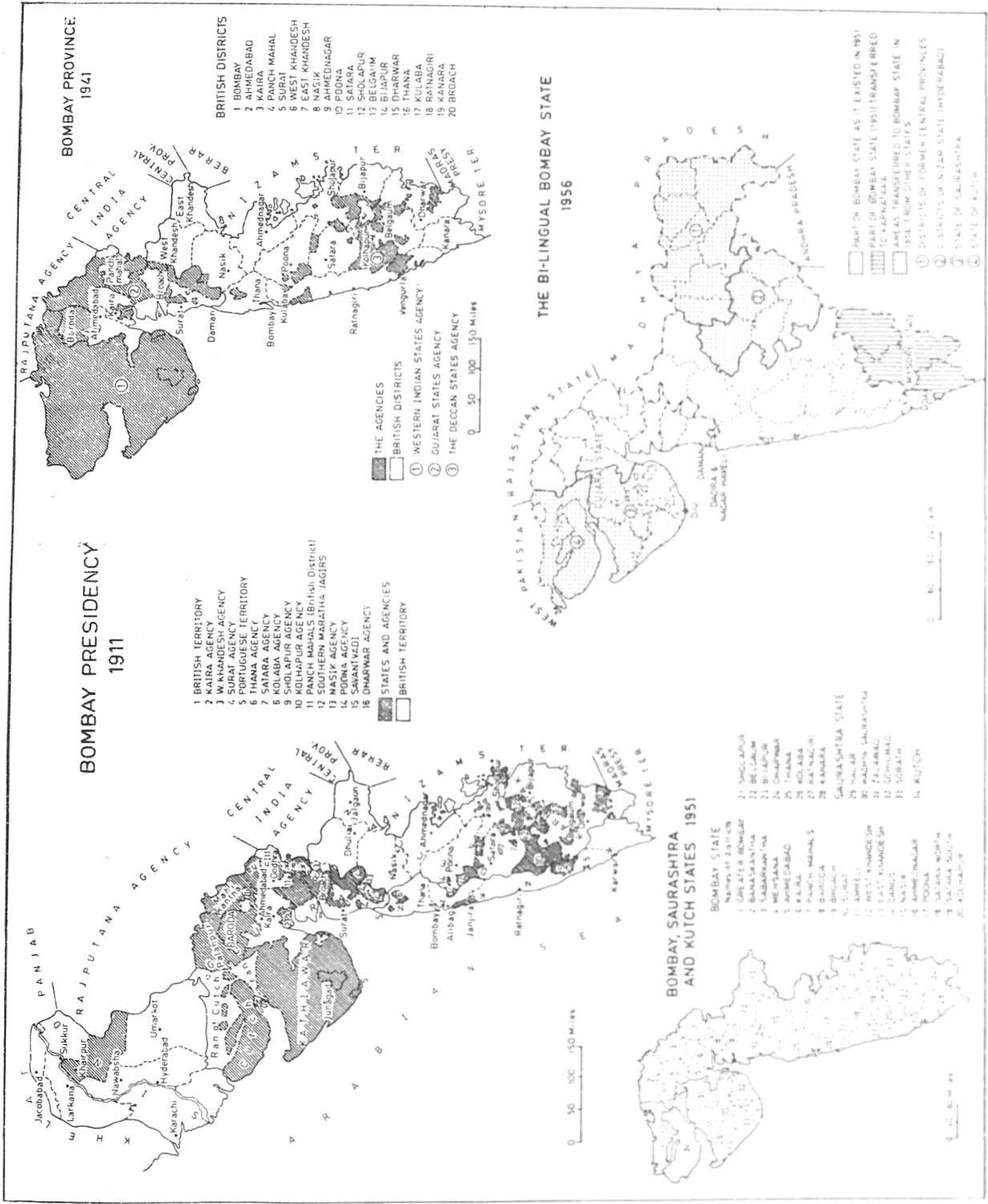
The bilingual state of Bombay did not last long and met with a great deal of resistance from the Marathi as well as the Gujarati speaking people. It was an exception to the general policy for no reason, and bringing together the two linguistic groups, who themselves wanted separate states, was hardly justified. Good sense prevailed, the Central Government yielded to the pressure, and on 1st May 1960, the two states of Maharashtra and Gujarat came into existence. The division of the bilingual state into Maharashtra and Gujarat did not create any problem, though the Marathi speaking people resented the loss of Dangs district to Gujarat. The loss of Belgaum to Karnatak is equally resented by Maharashtra as majority of the people in Belgaum city and some adjacent villages speak Marathi.

The present State of Maharashtra—The present State of Maharashtra bounded by the states of Gujarat, Madhya Pradesh, Karnatak and the Union territory of Goa, is one of the four littoral states of India that border the Arabian Sea.

It is the third largest state in India, next only to Madhya Pradesh and Rajasthan; and with a high level of economic and cultural development symbolizes the progress and achievement of the country. Occupying an area of 307,609 sq.km. and having a population of 67,784,000 (1981), the State accounts for a little over nine per cent of the area as well as the population of India. The distinctive features of the land of Maharashtra are the Arabian Sea-board, the Sahyadris which represent all that is great and beautiful in Maharashtra, and the basaltic plateau known for its black cotton soil and jowar. The hierarchical pattern of the State's administration finds its expression in the four divisions, thirty districts and as many as 302 talukas into which it is divided. Besides being the most industrialized state, Maharashtra handles bulk of the country's international trade, through the port city of Bombay which is aptly described as the economic capital of India. The State has, as compared to the national average, a much higher level of per capita income (Rs. 2,525), literacy (47.18%) and urbanization (35%).

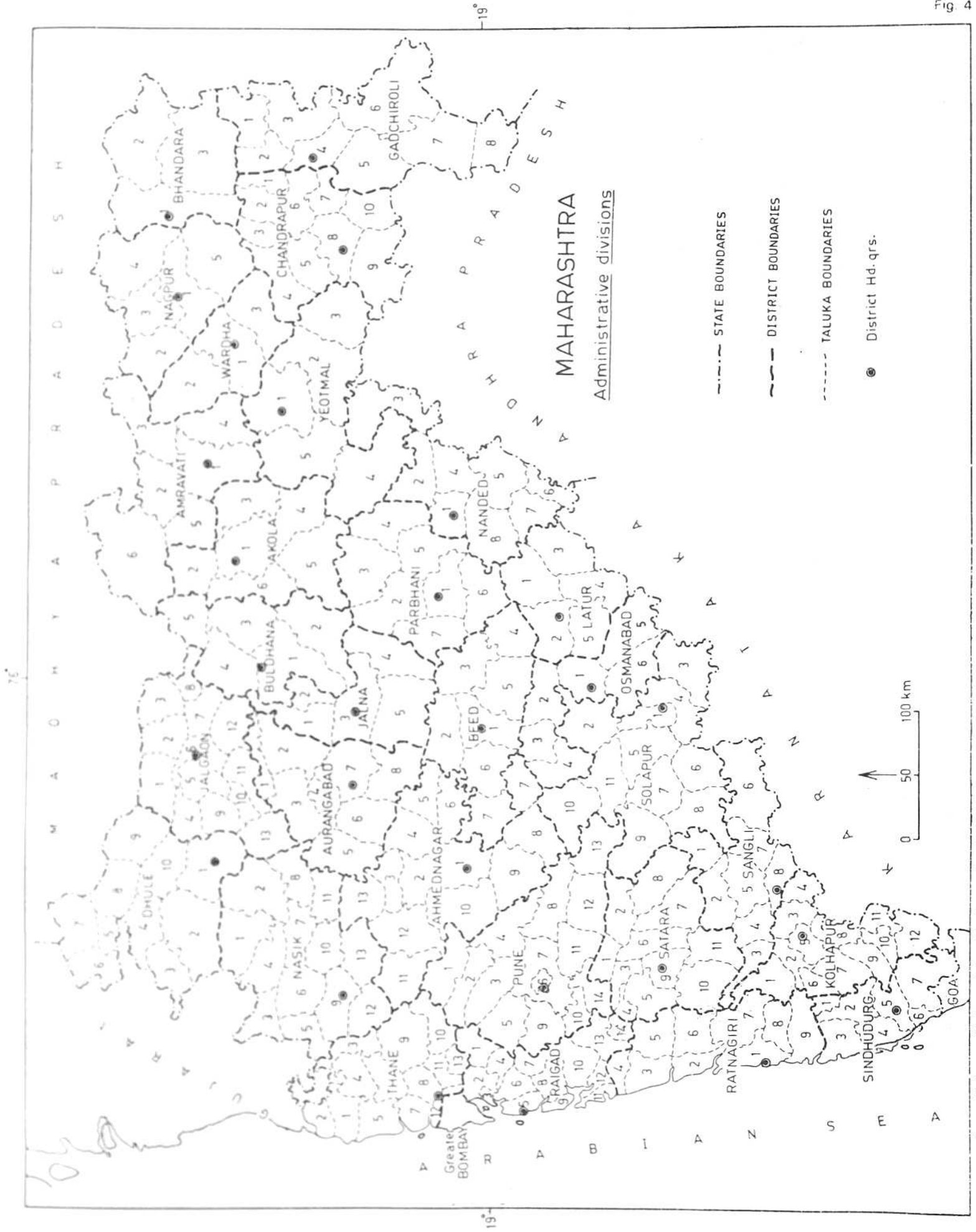
Like the other states of India, Maharashtra's areal organization has a linguistic basis and the State is largely inhabited by Marathi-speaking people, proud of their history, culture and language. Bombay, the most important city and capital of Maharashtra, is a microcosm of India, inhabited by a variety of linguistic, cultural and regional groups, living harmoniously and presenting a truly national scene.

Fig. 3



Based upon Survey of India maps with the permission of the Survey General of India. The principal waters of India extend into the sea as a distance of marine leagues unless specified to the contrary under the Government of India copyright 1965.

Fig. 4



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985

DISTRICTS AND TALUKAS* OF MAHARASHTRA

- | | | |
|---|--|--|
| <p>1. GREATER BOMBAY</p> <p>2. THANE DISTRICT</p> <ol style="list-style-type: none"> 1. Dahanu 2. Talasari 3. Mokhada 4. Jawhar 5. Palghar 6. Wada 7. Bassein (Vasai) 8. Bhiwandi 9. Shahapur 10. Murbad 11. Kalyan 12. Thane 13. Ulhasnagar <p>3. RAIGARH (KOLABA) DISTRICT</p> <ol style="list-style-type: none"> 1. Karjat 2. Panvel 3. Uran 4. Khalapur 5. Alibag 6. Pen 7. Sudhagad (Pali) 8. Roha 9. Murud 10. Mangaon 11. Shriwardhan 12. Mhasala 13. Mahad 14. Poladpur <p>4. RATNAGIRI DISTRICT</p> <ol style="list-style-type: none"> 1. Ratnagiri 2. Guhagar 3. Dapoli 4. Mandangad 5. Khed 6. Chiplun 7. Sangameshwar (Devrukh) 8. Lanja 9. Rajapur <p>5. SINDHUDURG DISTRICT</p> <ol style="list-style-type: none"> 1. Vaibhavvadi 2. Kankauli 3. Devgad 4. Malwan 5. Kudal 6. Vengurla 7. Sawantwadi <p>6. NASHIK DISTRICT</p> <ol style="list-style-type: none"> 1. Baglan (Satana) 2. Malegaon 3. Surgana 4. Kalwan 5. Peint 6. Dindori 7. Chandvad 8. Nandgaon 9. Nasik 10. Niphad 11. Yeola 12. Igatpuri 13. Sinnar | <p>7. DHULIA (DHULE) DISTRICT</p> <ol style="list-style-type: none"> 1. Dhulia Taluka 2. Sakri 3. Nawapur 4. Nandurbar 5. Taloda 6. Akkalkuwa 7. Akrani (Dhadgaon) 8. Shahada 9. Shirpur 10. Sindkheda <p>8. JALGAON DISTRICT</p> <ol style="list-style-type: none"> 1. Chopda 2. Yawal 3. Raver 4. Amalner 5. Erandol 6. Jalgaon 7. Bhusawal 8. Edlbad 9. Parola 10. Bhadgaon 11. Pachora 12. Jamner 13. Chalisgaon <p>9. AHMADNAGAR DISTRICT</p> <ol style="list-style-type: none"> 1. Ahmadnagar 2. Rahuri 3. Shrirampur 4. Newasa 5. Shevgaon 6. Pathardi 7. Jamkhed 8. Karjat 9. Shrigonda 10. Parner 11. Akola 12. Sangamner 13. Kopergaon <p>10. PUNE DISTRICT</p> <ol style="list-style-type: none"> 1. Junner 2. Ambegaon (Ghodegaon) 3. Khed 4. Shirur 5. Mawal (Vadgaon) 6. Pune city 7. Haveli 8. Dhond (Daund) 9. Mulshi (Paud) 10. Velhe 11. Purandhar (Saswad) 12. Baramati 13. Indapur 14. Bhore <p>11. SATARA DISTRICT</p> <ol style="list-style-type: none"> 1. Khandala 2. Phaltan 3. Wai 4. Mahabaleshwar 5. Jaoli (Medha) 6. Koregaon 7. Khatav (Vaduj) | <ol style="list-style-type: none"> 8. Man (Dahiwadi) 9. Satara 10. Patan 11. Karad <p>12. SANGLI DISTRICT</p> <ol style="list-style-type: none"> 1. Atpadi 2. Khanapur (Vita) 3. Shirala 4. Walwa 5. Tasgaon 6. Jath 7. Kavathe Mahankal 8. Miraj (Sangli) <p>13. SHOLAPUR DISTRICT</p> <ol style="list-style-type: none"> 1. Sholapur North 2. Barshi 3. Akkalkot 4. Sholapur South 5. Mohol 6. Mangalwedha 7. Pandharpur 8. Sangola 9. Malshiras 10. Karmala 11. Madha <p>14. KOLHAPUR DISTRICT</p> <ol style="list-style-type: none"> 1. Shahuwadi 2. Panhala 3. Hatkangale 4. Shirol 5. Karveer 6. Bawada 7. Radhanagari 8. Kagal 9. Bhudargad (Gargoti) 10. Ajra 11. Gadhinglaj 12. Chandgad <p>15. AURANGABAD DISTRICT</p> <ol style="list-style-type: none"> 1. Soegaon 2. Sillod 3. Kannad 4. Khuldabad 5. Vajapur 6. Gangapur 7. Aurangabad 8. Paithan <p>16. JALNA DISTRICT</p> <ol style="list-style-type: none"> 1. Bhokardan 2. Jafferabad 3. Jalna 4. Partur 5. Ambad <p>17. PARBHANI DISTRICT</p> <ol style="list-style-type: none"> 1. Parbhani 2. Jintur 3. Hingoli 4. Kalamnuri 5. Basmath 6. Gangakhed 7. Pathri |
|---|--|--|

* Serial numbers of the talukas conform to the taluka numbers in the map showing administrative divisions

DISTRICTS AND TALUKAS* OF MAHARASHTRA—*contd.***18. BEED DISTRICT**

1. Beed
2. Georai
3. Manjlegaon
4. Ambejogai
5. Kaij
6. Patoda
7. Ashti

19. NANDED DISTRICT

1. Nanded
2. Hadgaon
3. Kinwat
4. Bhokar
5. Bilodi (Biloli)
6. Deglur
7. Mukhed
8. Kandhar

20. OSMANABAD DISTRICT

1. Osmanabad
2. Kalamb
3. Bhum
4. Paranda
5. Umarga
6. Tuljapur

21. LATUR DISTRICT

1. Ahmadpur
2. Latur
3. Udgir
4. Nilanga
5. Ausa

22. BULDANA DISTRICT

1. Chikhli (Buldana)
2. Mekhar
3. Khamgaon
4. Malkapur
5. Jalgaon

23. AKOLA DISTRICT

1. Akola
2. Akot
3. Murtizapur
4. Mangrulpir
5. Washim
6. Balapur

24. AMRAVATI DISTRICT

1. Amravati
2. Achalpur
3. Morshi
4. Chandur
5. Daryapur
6. Melghat (Dharni)

25. YAVATMAL DISTRICT

1. Yavatmal
2. Kelapur (Pandharkaoda)
3. Wani
4. Pusad
5. Darwha

26. WARDHA DISTRICT

1. Wardha
2. Arvi
3. Hinganghat

27. NAGPUR DISTRICT

1. Nagpur
2. Katol
3. Savner
4. Ramtek
5. Umred

28. BHANDARA DISTRICT

1. Bhandara
2. Gondiya
3. Sakoli

29. CHANDRAPUR DISTRICT

1. Brahmपुरi
2. Nagbhid
3. Chimur
4. Warora
5. Bhadravati
6. Sindewahi
7. Mul
8. Chandrapur
9. Rajura
10. Gondpipri

30. GADCHIROLI DISTRICT

1. Kurkheda
2. Armori
3. Dhanda
4. Gadchiroli
5. Chamroshi
6. Ittapalli
7. Aheri
8. Sironcha

* Serial numbers of the talukas conform to the taluka numbers in the map showing administrative divisions.

CHAPTER II

PREHISTORIC AND PROTOHISTORIC MAHARASHTRA

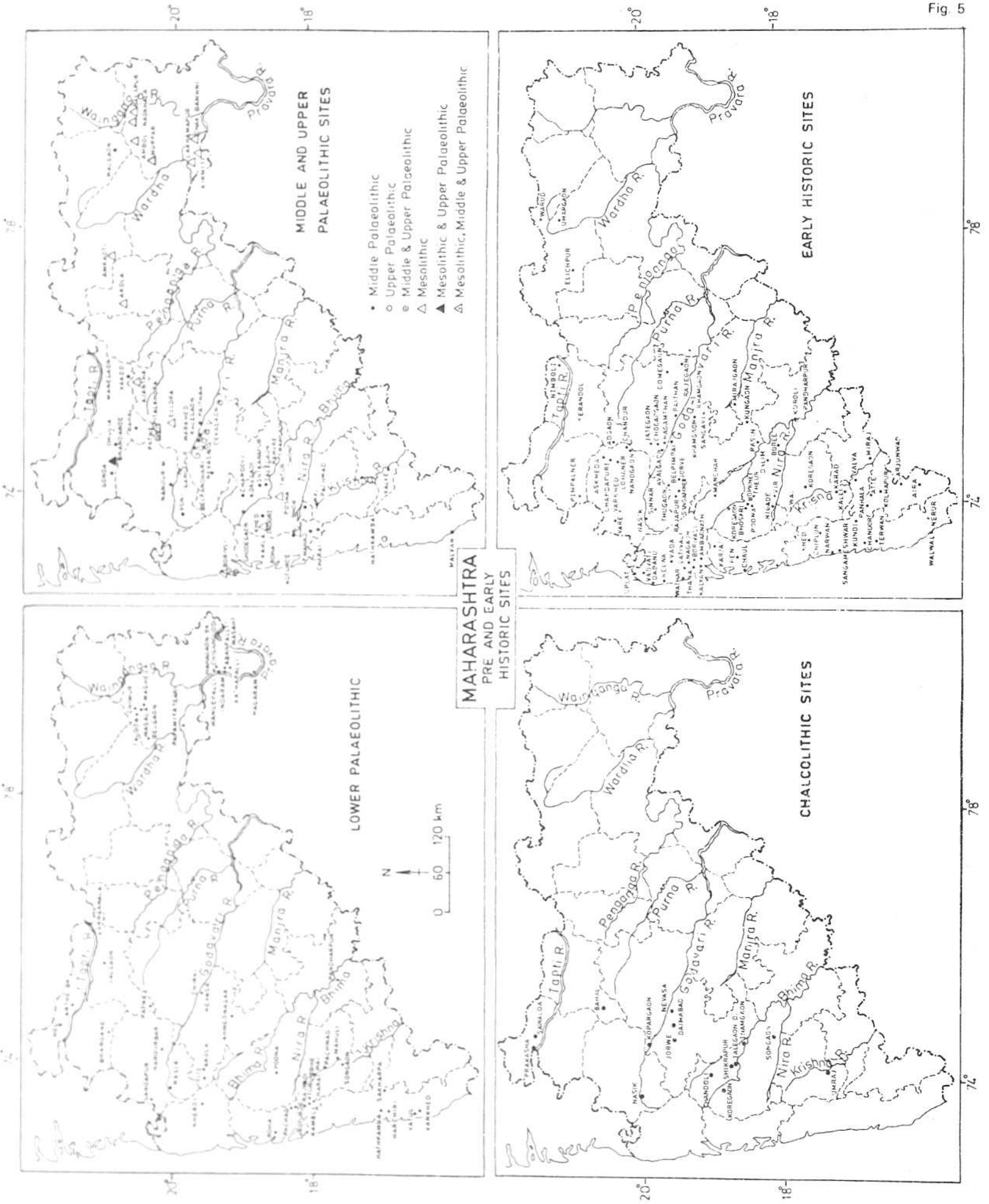
The entire length and breadth of Maharashtra is characterized by traces of early man's occupation. These traces occur in the form of the fossil tools used by early man, his skeletal remains and his habitation. When 'man' really appeared in Maharashtra is difficult to say, but going by the typology of tools that are found in different parts of the country, one would conclude that the early man was wandering around in Maharashtra as early as 500,000 years ago, though in Africa, the genus 'homo' emerged on the scene as early as 2 million years B.P. through a long process of evolution.

The tools of early man as discovered in the earliest of river deposits consisted of cores, choppers, scrapers, cleavers and even hand axes. The earliest of these tools are pebble tools worked from riverborne gravels, usually of basalt, the dominant rock in Western Maharashtra. These tools give an idea of the equipment of early man and the way possibly he was eking out his living. It is widely accepted and well known that man shaped his tools, to start with, from the rocks in the vicinity, the hardest material he could lay his hand on, and that he could use, both for offensive and defensive purposes and to perform tasks for which he found his paws, jaws, hands and muscle power inadequate. The quality and effectiveness of these tools improved with the lapse of time and thus the entire stone age, forming the base of the history of civilization is divided into Palaeolithic, Mesolithic and Neolithic cultures. Archaeologists have tried to establish a distinction on the basis of tool typology, and even the palaeolithic period is further divided into early, middle and late chronologically, or lower, middle and upper palaeolithic, stratigraphically.

Though there are many sites where the lower palaeolithic tools, largely worked out of gravels, are found, Poona, Nasik, Chirki-Nevasa and Bhadane are the most prominent sites. Apparently, man lived in these valleys close to water, and there are indications that he may have occupied sites not far from the perennial rivers like Godavari, Krishna, Bhima, Wardha, Wainganga and Tapi. In stratigraphically corresponding beds, fossils of rhinoceros, elephant and ox have also been found occasionally suggesting that the early man lived in a milieu which was dominated by large herbivores, rich in plant life and grasses that provided the feed. In areas where quartzites or other crystalline rocks composed the terrain, the nature of tools changed. The early man was as ingenious as the modern man in his own way, and discarded the idea of depending on river gravels for his tools, instead, he concentrated on chips of rocks or flakes which were sharper and had a greater telling effect. This heralded another step in man's progress towards conquering nature. The development of flake tools is identified with the middle palaeolithic age, dated variously between 17,000 and 40,000 years B.P.

The evidence of the use of flake tools and the occurrence of middle palaeolithic sites, formerly thought to be rare, is considerable. Formerly known only in Poona and Ahmadnagar districts, flake tools are now found in all parts of Maharashtra—Khandesh, Marathwada, Vidarbha and even Konkan. One may observe that though about 30,000 years ago human population was well spread in Maharashtra, as suggested by Dr. Sankalia, it may not have made much of an impact on the ecological landscape of which man was a part. The notable flake-tool sites in western Maharashtra are Nevasa on Pravara, and Bel Pandhari, Suregan, Kalegaon and Nandur Madhmeshwar on Godavari, all in Ahmadnagar district. Numerous sites in Poona district, besides the well known Koregaon site, and even from Satara and Sangli have been identified. In Khandesh, Ranak Nala, a tributary of Tapi and Kan valley are rich in middle palaeolithic tools.

The flake-tools that the middle palaeolithic man manufactured and used could be classified as points, scrapers and borers of all sizes, but usually large. The typology of tools shows some modification in Eastern Maharashtra, where basaltic rocks are replaced by gneiss-granitic rocks. More often, one finds quartzite, chert and fine grained material derived from the crystalline terrain. Thus at Patala near Nagpur, one finds very advanced specimens of flake-tools, basically a reflection of the availability of fine-grained rocks. The control of rocks on the nature of tools is apparent even at Kandivli-Borivli near Bombay where man appeared only with flake tools derived from veins or vesicles and the site shows a preponderance of middle palaeolithic tools in chert, jasper and chalcedony.



The middle palaeolithic imperceptibly merges into upper palaeolithic with a predominance of blade tools. Besides Kandivli and Borivli, Nevasa in Ahmadnagar, Bhadne in Dhulia district, and Patne in Jalgaon district offer sites which present tools that include fluted cores, parallel-sided blades, burins, scrapers and flakes.

Further advance in man's culture is represented by his ability to fashion smaller and sharper tools in place of bulky and crude lower or middle palaeolithic tools. Such tools known as 'microliths' are typical of a transitional phase between the palaeolithic and neolithic cultures. Microliths have been reported from several parts of Maharashtra. These occupy the flat surface in basalt, the mesas or even the top of the lateritic plateaus. In over-hangs and natural caves, one usually finds microliths. Their ubiquitous occurrence is deceptive and should be interpreted as symbolic of growing population of early man and his wider distribution. Being light, microliths are amenable to transport by wind and water more easily, secondly, chips of quartz, chalcedony and agate veins may appear like microliths. An important fact about microliths is their relative abundance in Konkan which can be interpreted as evolution of fishing and the use of microliths for cutting meat and skinning small animals, where microliths could have been used as a penknife is used today. It must be emphasized that the ease of transport must have been a factor weighing with early man. While occupying difficult sites, like caves in a cliff, the transport and storage of gross tools must have posed a problem. In fact, one would like to divide the tools into (a) field-tools and the (b) domestic tools, and one would think that microliths represent a phase when man had developed an institution of shelter, home and refuge for a semi permanent habitation.

With the introduction of microliths, the domestic tools, man found it easier to clean and cook his food and developed the art of making pottery, and perfecting his tools by grinding, polishing and sharpening them. In fact, the Neolithic period in the history of civilization is recognized as the period when man used tools of ground stone. The addition of pottery and the association of ground tools with occasional copper tools, combined with domestication of animals heralded what one may term neolithic-chalcolithic culture.

The mesolithic.—Chalcolithic cultures present very tangible evidence of man's permanent or semi permanent habitation. In Maharashtra, chalcolithic sites extend in a broad longitudinal belt extending from Tapi southward. Not all the sites are alike as they represent sub-regional sub-cultures and a stage in chronological evolution. The most well known is 'Prakash culture' named after the village Prakash in Dhule District. The chalcolithic village was, as suggested by excavation, on a river terrace and was deserted as a result of flood. According to Sankalia, the first inhabitants of Prakash were the migrants from Malwa and the culture carried resemblance with Navdatoli, with similar pottery. An age of 1700-1500 B.C. on the basis of C-14 analysis from Navdatoli, Nevasa and Chandoli is assigned to human occupation at Prakash. Close to Prakash is Sawalda, another chalcolithic site, existing as one of the group of over 20 more sites on the river Panjhra. During the last thirty years, a number of chalcolithic sites have been discovered. These include Jorwe, Nevasa and Daimabad in Ahmadnagar district, and Chandoli, Songaon and Inamgaon in Pune district. Not too far from each other and almost on the bank of Pravara river, the two sites, Jorwe and Nevasa, together, are representative of what one calls, for want of a better term, the Jorwe-Nevasa culture. Daimabad is older than Jorwe or Nevasa, and is characterized by coarse grey ware. The tools of the chalcolithic sites particularly those associated with Daimabad, were either parallel sided blades of chalcedony or polished axes of basalt. These sites are dated to 1500 B.C. Burial was a common practice and the dead were buried in the habitation itself.

Western Maharashtra, it appears, experienced a two-way movement of culture. By about 1500 B.C., Malwa culture had spread south of Tapi, and almost at the same time there was a movement of a culture from the south. Besides Daimabad, Chandoli, Songaon and Inamgaon also show Malwa pottery. "What is interesting is that both at Daimabad and Chandoli we find a fusion of the Malwa and Jorwe cultural traits in the rimless globular pot with a tubular spout. This is also indicated by the occurrence of a legged bowl in Malwa fabric at Chandoli." The Nevasa site has several phases, but there is not much of a change in the construction of houses in different phases.

The most interesting and perhaps the most well excavated chalcolithic site is at Inamgaon excavated by Dhavalikar and his colleagues. The buried settlement appears to have survived many catastrophic changes and lasted for well over 900 years (1600-700 B.C.). The people of Inamgaon

possessed, it seems, an idea of water management, and a relatively more advanced kiln for baking their pots and pans. The site showed both, rectangular Malwa type houses as well as large Jorwe type. Usually a passage five feet wide appeared between two houses. The entire span of occupation of Inamgaon settlement is divided into Malwa, Early Jorwe and late Jorwe phases, a gradation under which the Malwa type of houses gives place to Early Jorwe and then to late Jorwe type. In a span of about 900 years (1600-700 B.C.), the rectangular houses give place to circular huts. It is quite likely that poverty caused by drought, or flood, or a sense of insecurity because of an invading group, prompted them to live close to each other occupying as little place for privacy in the family as they could.

The people inhabiting the settlements either at Nevasa, or at Inamgaon had started producing foodgrains and lived atleast partly on foodgrains as suggested by the presence of storage jars. Wheat, lentil, peas and horsegram have been identified among the charred remains of foodgrains. This does not mean that the inhabitants of these settlements had given up wild game. Far from it, they used to hunt deer, pig, ox and other animals for their living.

Burials were common, and even most common, in the pre-historic settlement at Inamgaon, though the mode of burial was not uniform. Inamgaon is the youngest pre-historic site in Maharashtra discovered so far.

The Early historic sites.—Maharashtra has quite a few early historic sites. Among them, a few which are most commonly known are given below. One of the earliest sites is *Nanded*. Some historians believe that the town existed in antiquity and marked the southernmost extension of the Nanda empire. Thus Nanded could be a 2500 year old city.

Sopara.—The Ashokan edict makes a mention of Sopara in Thane district. During Ashokan period, it was a port, prosperous and thriving. Now the place has lost its significance because of the silting of the creek on which it was located and the recession of sea.

Paithan.—The town on Godavari, known for its association with Sant Dnyaneshwar, was the capital of Andhra—Satvahanas. The Satvahanas originated from Andhra Pradesh and migrated up the Godavari valley. They chose Paithan because of its central location. Upstream beyond Paithan, Godavari is not navigable and this must have been an additional factor in the choice of Paithan as a capital. Situated in the dry core of Maharashtra, the town has an assured ground water supply from the gravelly and alluvial terraces and the flood plains of Godavari.

Kalyan.—Another town associated with the Satvahanas was Kalyan, a town located on a creek—today, Kalyan has grown into a large city, close to Bombay. A break-of-bulk-city, it is today a part of Kalyan-Ulhasnagar agglomeration.

During the reign of Chalukyas, the following cities were important. None of these places is important today. Mention may be made here of *Arjunawa* (Kolhapur), *Bhadli* (Thane district), *Nerur* (near Sawantwadi in Ratnagiri district), *Narwan* (Ratnagiri) and *Vir* (near Bhore) in Pune district.

Rashtrakutas, who ruled after the Chalukyas, shifted their capital to Malkhed (Manyakhetra), now in Andhra Pradesh, and set up a number of regional centres for administration. *Chandanpuri* and *Varkhed* (Nasik district), *Kalas* (Poona district), *Kalli* and *Pargaon* (Satara district), *Nasik*, and *Rampuri* (East Khandesh district) were important places.

The Silaharas who ruled as feudatory kings in north Konkan and Kolhapur had developed the following important regional centres. *Kolhapur*, *Bhadan*, *Mor* and *Vadvali* (Thane district), *Puri* (Kolaba district) and *Sangameshwar* in Ratnagiri district. Besides these places of Konkan, were *Brahmanpuri*, *Kanvad*, *Kurunvad* and *Valva* in Kolhapur district.

The Yadvas who were the last Hindu Kings before the advent of Muslims rule in the Deccan established their capital at Devgiri, modern Daulatabad. Besides, a number of centres were flourishing during their rule. These were *Chikhli*, *Gudha* and *Sangamner* in Ahmadnagar district, *Karad* in Satara district and *Vilapuri* in Sholapur district. Besides, there are a large number of ancient historic sites whose names are changed beyond recognition.

CHAPTER III

GEOLOGY AND MINERALS OF MAHARASHTRA

Structurally, Maharashtra is a part of the peninsular shield, and much of it is covered with lava rocks, which have been subjected to denudation for more than 30 million years, since their effusion and solidification. The basaltic plateau rests above the archaean base which is composed of crystalline gneisses and schists. Almost all the formations from the archaean to the pre-cambrian are exposed in one part of Maharashtra or the other, but a majority of them have their outcrops in the eastern part of the State where the height of the plateau decreases and the basaltic flows thin out and disappear to expose the underlying rocks. The Archaeans, the Dharwars, the Cuddappahs and the Vindhyaans, all are exposed in Chandrapur, Nagpur and Bhandara districts. The Kaladgis with their sandstones and quartzites are exposed in Konkan, Ratnagiri district, wherever the overlying basalts are removed by erosion. Eastern Maharashtra is, therefore, virtually a museum of a whole sequence of rocks from the Archaean to Cambrian. The hiatus signifying the absence of primary formations occurred possibly because much of the palaeozoic was a scene of denudation, and no sedimentation took place in this part of the world.

The global cataclysm that occurred at the close of the Palaeozoic not only threw many sedimentary terrain into folds but also ruptured the crust in many parts of the world developing fault troughs and rift-valleys in which sediments accumulated during the carboniferous and permian periods. The coal mined in Chandrapur, Nagpur and Yavatmal districts, belongs to the lower Gondawana series. The sandstones and the limestones of Sironcha tehsil represent the Triassic and Jurassic deposits. The close of the Mesozoic is marked by the Himalayan orogeny and a concurrent upwelling of the lava in the Deccan. The basaltic plateau was not formed by a single event of volcanic activity, but developed in phases, by intermittent lava flows, as is clear from the inter-trappeans, which suggest either a predominance of sub-aerial activity for some time or a change in the nature of volcanic activity itself. The entire thickness of the lava flow is not a product of a single continued flow of magma. The earliest lava flows date back to late Cretaceous and are 70 million years old. The volcanic activity did continue long enough to extend into the Tertiary.

The single most important geological feature of Maharashtra is the basaltic plateau of the Deccan. The traps are divisible into three major groups—

- | | | |
|-----------------|----|-----------------|
| 1. Upper Traps | .. | 1500' thickness |
| 2. Middle Traps | .. | 4000' thickness |
| 3. Lower Traps | .. | .. |

The term Deccan Trap was first used by W.H. Sykes in 1838. The word has, since then, been increasingly used and is now used in the lithological sense of the rock basalt. The thickness of the basalt on the plateau increases from east to west. While close to Nagpur, one finds the outcrops of infra basaltic formations, in the Western Ghats close to Bombay, their thickness reaches a magnitude of 7000'. The traps do not show any sign of tectonic disturbance except the Western Ghats fault and the related Panvel flexures, both inferred from the indirect evidence of geomorphology and gravity anomaly. The basalt is a basic igneous rock resulting from the solidification of basic magma which came up through fissures.

The question of the origin of Deccan basalt has been very intriguing. While it is generally accepted that the magma came to the surface through a series of fissures, which are today marked by dykes, the absence of dykes in 2/3 of the Deccan Trap area compounds the problem. W.D. West suggested that the extensive occurrence of the Deccan Trap could be explained by high fluidity of the basaltic magma due to a high percentage of iron oxide or due to the gaseous reactions that would maintain the temperature of the magma as it flowed, since according to him the magma that would erupt through fissures will have greater fluidity than the lava issuing from a volcano.

The basalts are composed of a variety of minerals. The chief among these are plagioclase, Pyroxene, iron-oxides and certain other constituents. A modal analysis shows the following composition:—

T-3.1 Composition of Basalt

Minerals	Per cent	
Plagioclase	.. 38	
Pyroxenes	.. 45	Mahabaleshwar basalt (after S. G. Karkare)
Iron oxides	.. 9	to the nearest approximation.
Others	.. 8	

In a normal analysis the rocks show an abundance of silica alumina, iron oxides and lime. Washington's analysis of basalt from Panhala fort gives the following result:—

T-3.2 Composition of Basalt (after Washington)

Silica	.. 48.62	47.34	Lime	.. 9.49	9.36
Titania	.. 0.88	1.87	Magnesia	.. 5.29	7.72
Alumina	.. 14.12	14.30	Alkalies	.. 3.55	..
Ferric oxide	.. 2.29	4.89			
Ferrous oxide	.. 12.4	13.49	Common water	.. 2.28	1.23

Because of the gases involved cavities develop inside basalts. These are known as amygdale and such basalt is known as amygdaloidal basalt. Thus basalts could be either massive and compact or amygdaloidal. The latter are less resistant and usually give rise to gentle slopes, but if a massive basaltic flow overlies a vesicular flow, the slope is steeper. The basaltic landscape presents an assemblage of table-lands usually known as mesas and when detached standing as outliers, they are identified as buttes.

There are no geological formations of a later origin. The basalts are overlain by alluvial deposits in the valleys and are covered with residual soils on the plateau. In high rainfall areas of Western Ghats and Konkan, they have undergone a hydro-thermal weathering and are covered with laterites.

The laterites occupying the higher plateaus of Western Ghats like Mahabaleshwar, Panchgani and Matheran, and much of the Konkan in Ratnagiri district have resulted from the chemical weathering and leaching of ferruginous rocks like basalt. The laterites usually occur in areas with more than 2500 mm of rains. The chemical alteration of basalt produces an altogether different rock, and from the visual aspect of laterites one cannot make out the parent rocks. The indurated laterites have a high concentration of iron and aluminum. In the laterites of Mahabaleshwar and Konkan, there is an abundance of alumina ranging from 30 to 55 per cent. The percentage of iron oxides also varies widely, though in most cases it exceeds 30 per cent. A well indurated laterite on a plateau may have as much as 50 per cent iron whereas the maximum concentration of alumina in the lateritic profile is always below the surface.

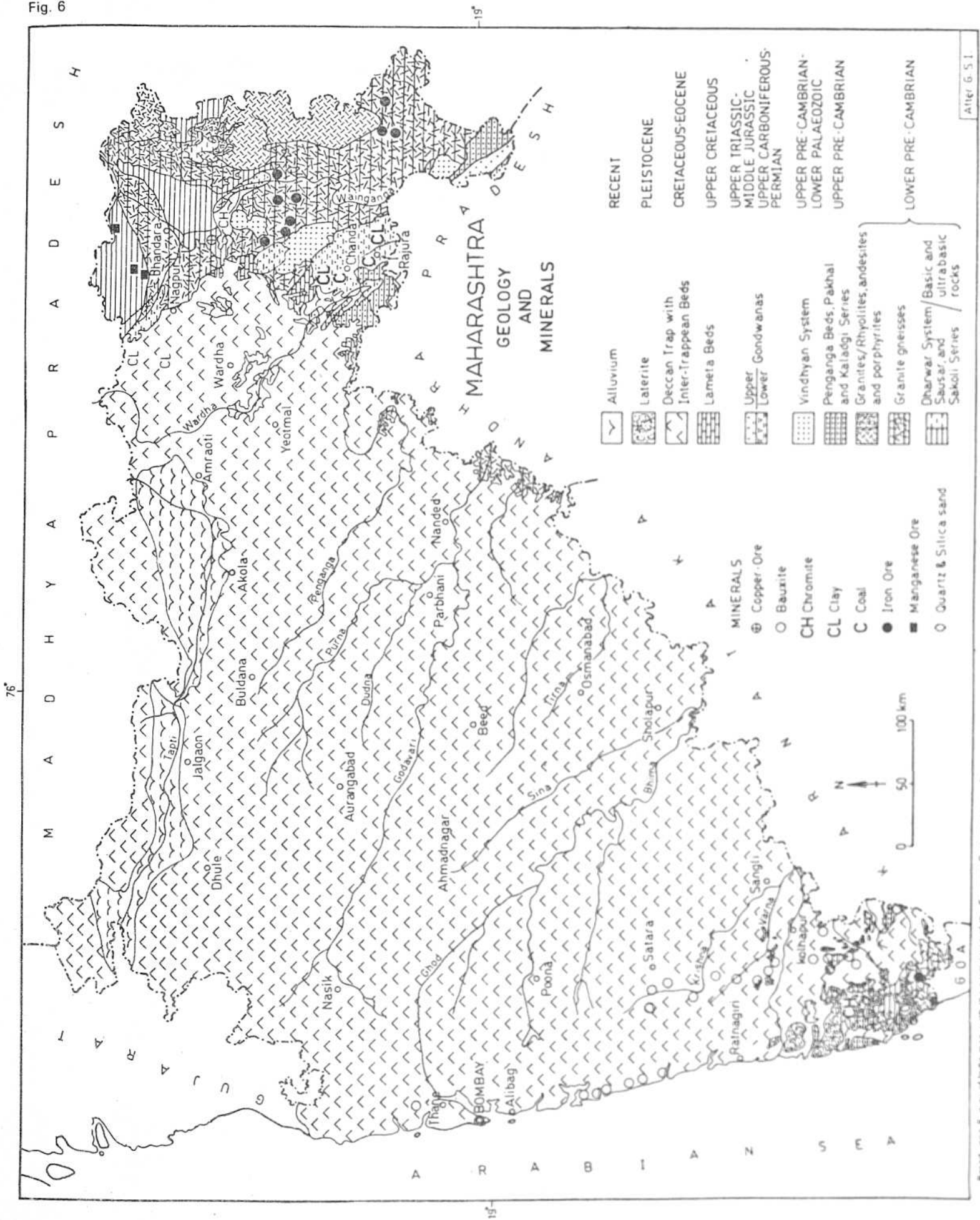
The presence of silica is minimal in all the laterites. Normally, it does not exceed 40 per cent. The laterites have a low pH and are highly acidic and therefore do not support vegetation. Being indurated they are not arable and are used as building material.

Mineral Wealth of Maharashtra

The principal minerals occurring in Maharashtra are the following:—

1. Coal
2. Iron ore
3. Limestone and dolomite
4. Bauxite
5. Manganese
6. Chromite
7. Clay
8. Copper
9. Silica sand
10. Ilmenite
11. Petroleum.—Though not strictly in Maharashtra, its production in Bombay High is more intimately linked with Maharashtra because of the location of storage and refinery in Bombay.

Fig. 6



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1965

Coal.—Geologically the coal fields of Maharashtra belong to the Barakar series of Gondwana system. There are four important coal fields, the Kamptee, Umrer and Bokhara coalfields, all in Nagpur district and the Wardha valley coal fields which extend into Chanda and Yavatmal districts. The estimated reserves of coal in different coal fields are as follows:—

T-3.3 *Coal Reserves in Maharashtra*

Coal fields	Reserve in million tonnes
Kamptee coalfields	75.31
Umrer	70.00
Bokhara	2.95
Wardha valley coal fields	
1. Chanda coalfields	N.A.
2. Ghugus-Tewasa	1,000.00
3. Ballapur coal field	2,000.00
4. Sasti Rajura	100.00
5. Warora	60.00
6. Majri	50.00
7. Bandar	100.00
8. Rajur Wani	240.00

The known reserves of coal in Maharashtra are estimated at 5,000 million tonnes in the three districts of Nagpur, Chanda and Yavatmal. The production of coal in the state has been steadily increasing though this cannot go on indefinitely as the reserves are limited—

	Production in million tonnes
1960	0.8
1965	1.13
1975	3.59

Iron ore.—Iron ore in Maharashtra is found in Chanda, Bhandara and Ratnagiri districts. The ore in Chanda is of sedimentary origin, enriched later on. In Bhandara, these are of igneous origin and in Ratnagiri district iron ore is associated with banded hematite quartzite where the leaching of silica has enriched the ore.

The total iron-ore reserves of various qualities are estimated at more than hundred million tonnes. These include the Khursipar deposits of Bhandara, which are a magnetite ore, the deposits of Surajgarh, Wadwi-Damkod and Bhamragarh ranges of Chanda and at Redi in Sindhudurg district. The deposits at Redi and Banda belong to Dharwar age and are overlain by a thick cover of laterite. The iron ore are derived from banded hematite quartzite. In no part of the State the quality of ore is very poor. The percentage of iron in Bhandara is 54 per cent, Chandrapur—63-65 per cent, and Ratnagiri 58-65 per cent.

The production of iron-ore in the state shows wide yearly fluctuations. The current production lingering around one million tonnes, almost entirely comes from Ratnagiri and Sindhudurg. The production from Chanda is insignificant. Almost the entire ore produced in Ratnagiri and Sindhudurg districts is exported from Redi port. The Chanda ore has remained untapped for a long time and it is hoped that the mini steel plant at Chanda, which is under construction will be able to utilize the local iron ore.

Limestone and Dolomite.—Though used in a number of industries, the mineral is massively consumed in cement industry. Limestone being calcium carbonate and the dolomite being the double carbonate of calcium and magnesium, they are of marine or fresh water origin. Maharashtra has a reserve of 5,000 million tonnes of limestone, most of which is in Yavatmal and Chandrapur districts. The annual production is about 500,000 tonnes, largely in Yavatmal. The limestone deposits in Yavatmal district occur in several belts like Rajur belt, Mukutban area, Sindola-Chanaka-Paramdoh belt. In Chandrapur they occur in Warora and Rajura tehsils occupying three belts, the Sangoda limestone belt, Avarpur-Gangapur-Bakardi belt, and Naranda-Pimpri-Vanuja belt. There are scattered deposits of limestone in Dhulia, Nanded, Sangli, Ahmednagar and Poona districts.

Manganese.—A very important mineral to be used in metallurgical industry, manganese is by far the most important mineral of Maharashtra since 30 per cent of the country's reserves of manganese occur here. The manganese deposits of the State are largely associated with the pre-cambrian metamorphic rocks of sedimentary origin. The ores consist of the alternate bands of manganese oxide and dark manganiferous quartzite in Bhandara district as a part of the Gondite series. Besides the main ore body in Bhandara district, some manganese occurs in other parts of the State as well in different geological associations. These are manganese with laterite in Satara district, with Kamthi rocks in Yavatmal district and the well known pre-cambrian metamorphic rocks in Nagpur, Bhandara and Ratnagiri districts. The economically exploitable manganese is confined to Bhandara, Nagpur and Ratnagiri districts only.

The production of manganese has been declining in the state for some time.

• T-3.4 *Manganese Production*

Year		Production in '000 tonnes
1955	..	318
1960	..	187
1965	..	317
1970	..	216
1975	..	185

About 15 per cent of the manganese production in the state is consumed locally in the ferro-manganese plants at Tumsar and Kanhan in Maharashtra and Garividi in Andhra Pradesh. The rest of the production is exported.

Bauxite.—The ore for aluminium, bauxite is formed by the weathering of alumina bearing minerals such as feldspaths and clays. These are the laterites which grade into bauxite with their high content of aluminium oxide. The rock is the product, like laterite, of hydrothermal weathering in tropical climate. Chemically it is hydrated oxide of aluminium. Since its genesis is related to heavy rainfall and because of its association with laterite, bauxite usually occurs in a warm heavy rainfall zone. In Maharashtra it occurs in Kolhapur, Ratnagiri, Raigarh, Thane and Satara districts. The plateau tops are the favoured sites for the occurrence of bauxite though their altitudes are highly variable. The content of aluminium oxide (Al_2O_3) in most bauxites is over 50 per cent. The annual production in the State is only a few thousand tonnes.

Other minerals which could be mentioned include chromite, clay, copper, silica, sand and ilmenite. Of these, the first three are in the eastern mineral belt of the State whereas silica sand and ilmenite occur in Ratnagiri district. Many of these minerals are associated with Pre-cambrians. Chromite occurs in the Archaeans in the ultra-basic rocks, copper in the Dharwars associated with quartz veins and silica sand with Kaladgi quartzites. Ilmenite, the oxide of iron and titanium, is derived from Deccan basalt which sometimes shows a very high concentration of this mineral. The processes of denudation lead to the selective concentration of these sands on the beaches.

□ □

CHAPTER IV

RELIEF AND PHYSICAL FEATURES

Topographically, Maharashtra is by and large a plateau, sloping gently eastwards. From the Sahyadrian water divide, which attains variable heights in different latitudes (600 m to over 1500 m) in the west, to Wardha-Wainganga plain in the east showing occasional lowlands of less than 100 m, the plateau presents a variety of relief features. West of the Sahyadris, is a longitudinal coastal strip separated from the Western Ghats by a 600 m escarpment and presenting a lowland where the heights vary from sea level to 350 m ASL. There are occasional residuals in the coastal plain which attain a height of about 400 m.

Thus the physical features of the State can be described within the framework of a broad two-fold physical divisions, *viz.* the Maharashtra plateau, and the coastal lowland, called the Konkan. If the Western Ghats are added, one has three broad physical divisions—

- (1) The Konkan coastal lowland
- (2) The Western Ghats, and
- (3) The Maharashtra plateau

The Konkan coastal plain.—This is a narrow coastal plain stretching all along the state. From north to south it covers a distance of about 500 km. The northern part of Konkan, much of the Thana and Raigarh districts, is relatively flat with occasional hillocks. A number of streams originating on the Sahyadrian scarp, meander their way to the sea. North of Bombay, a number of hills with a north-south alignment, border the coast just about 20 km inland, and the rivers originating in the Ghats have to cut through the hills which are depleted of their once luxuriant vegetation. The coast is dotted with a number of off-shore islands. Contrary to expectations, there are also north-south alignment of rivers close to the coast. Since the entire region is underlain by basalt, the anomalous orientation of rivers can be explained only by lines of weakness created by fractures, lineaments or tectonic depressions. The entire Salsette and Bombay islands are enclosed by an arm of sea, and it is quite likely that the estuary of Ulhas river aligned with Thana creek, extending into the sea as far as Bombay harbour is some kind of a tectonic depression.

The Ulhas basin, just on the back of Bombay, is a remarkably flat plain, formed by the abrasion of the sea at a time when the sealevel was higher than the present. Kalyan, Ulhasnagar and Karjat, all-trade centres and important railway stations are located in this plain. The plain also carries some outliers of the Western Ghats; the most well known being the Matheran hills which attain a height of 700 m ASL.

About 100 km south of Bombay, the Panvel-Pen-Alibagh coastal plain gives place to a more rugged topography and a general rise in the height of Konkan. The rivers appear entrenched, and a height of 200 m of the flat inter-fluves gives the aspect of a coastal plateau. From north to south, a number of streams traverse the coastal plain. The most important of them are Amba, Kundalika, Savitri and Shastri, from north to south. These rivers dissect the plateau which, in southern part of Konkan, is covered with laterite. In fact, the laterites dominate the landscape of south Konkan.

The rivers, almost all originating from the Western Ghats, cascading in their upper courses, descend to the coast guided by fractures and lineaments. Their valleys are very steep-sided like those in early stages of development or in a rejuvenated landscape. The relief is as much as 200 m. The valley sides make an angle of over 30°. In the lateritic plateau, the rivers are so deeply entrenched that one does not discover them till one encounters them. The estuaries of these rivers are drowned and the tidal impact is felt as far as 25 km inland. The occurrence of laterites in South Konkan has resulted from heavy rainfall (2500 mm), leaching of the rocks and their hardening. The laterites, a hydrothermal product of weathering are derived from basalt, and are rich in iron and aluminium. The depth of laterite on the plateau is variable, with a maximum thickness of about 10 m near Ratnagiri and also near Rajapur (about 20 m) South Konkan is agriculturally unproductive, because of lateritic cover which, due to its acidity, does not support any vegetation. Only in the valleys, narrow riverine plains grow paddy. The valley-side slopes, particularly their upper parts where the sub-lateritic horizons can be reached by trees, permit the growth of mangoes.

The coast is bordered by cliffs. At some places, these cliffs are as high as 50 or 60 metres, plunging into the sea. At others, there are littoral terraces or a line of dunes behind the beach. In South Konkan extending upto Sindhudurg district there are no coastal plains of the type one encounters in north Konkan.

The Western Ghats.—The Sahyadris, commonly known as Western Ghats, are not a typical folded mountain. One may consider them representing the western edge of the Deccan plateau where the original basaltic plateau reaching a height of 1500 m or over is still preserved in certain parts. The western edge of the plateau ends abruptly with an escarpment descending to the coastal lowland. The 600 m escarpment, very steep at places resembling a sheer wall, gives the semblance of a mountain to the Western Ghats particularly when one looks at it from Konkan. The Western Ghat escarpment, in all probability a fault escarpment, has receded considerably in course of time. The escarpment at the source of the major west flowing streams appears like an amphitheatre with a near vertical wall.

The crest line, here the water parting, fluctuates greatly in height from north to south. At places, it is represented by high altitude planation surfaces, like Bhimashankar plateau, 1100 m (just north of 19° latitude) and Mahabaleshwar plateau 1500 m (a little south of 18° north latitude). A height of 8-900 m is most common, but wherever the crest line is breached by headward erosion of the eastflowing streams, the continental divide lowers itself to even less than 700 m, such as at Lonawala. The highest point of the Sahyadris in Maharashtra is Kalsubai peak (1646 m). Other important heights on the crestline are as follows :—

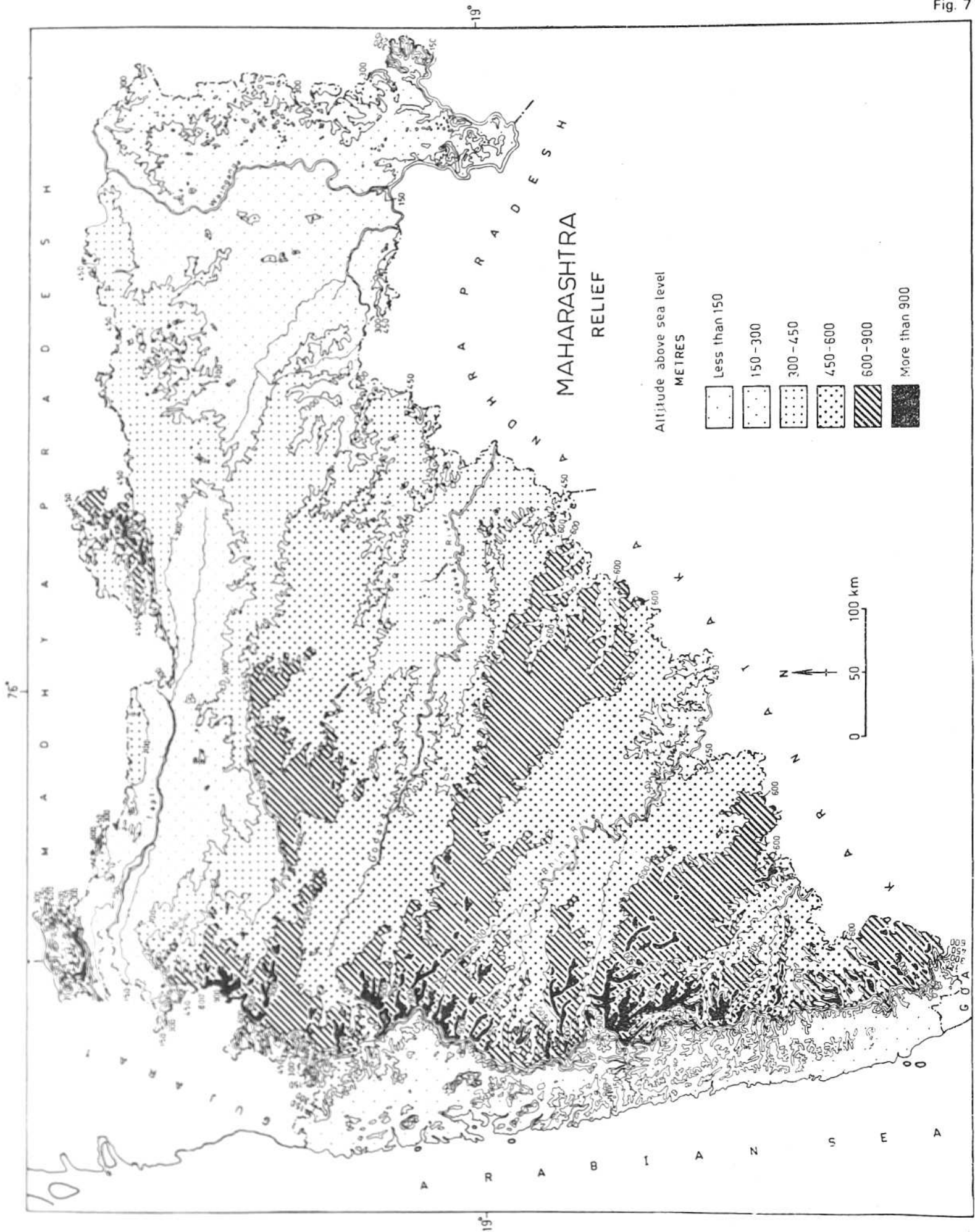
T-4.1 Location and Height of some Peaks in Western Ghats

	m/ASL	N. latitude
Kalsubai	.. 1646	19°—35'
Harishchandragadh	.. 1424	19°—27'
West of Junnar (Nane ghat)	.. 1264	19°—11'
Shingi	.. 1293	18°—55'
Tasubai	.. 1091	18°—48'
Ratnagiri	.. 1126	18°—30'
Torna	.. 1404	18°—15'
Dhangarwadi	.. 1275	18°—09'
Eruli	.. 1373	18°—03'
Mahabaleshwar	.. 1438	17°—55'
North of Kumbharlight	.. 1050	17°—25'
Makarandgarh	.. 1239	
Panhala range extension	.. 1024	16°—56'
North of Phondaghat	.. 901	16°—25'

As can be seen the crest-line decreases in height from north to South. Sahyadris are the source of all the principal rivers of not only Maharashtra but the whole of Deccan. The most important of these, the Godavari and the Krishna, have their sources in the Western Ghats, the former originating from near Nashik and the latter debouching from Mahabaleshwar. From the main axis of Western Ghats a number of offshoots project eastward. These are the interfluves between the principal rivers. Thus an alternation of valleys and interfluves takes place. The Sahyadris are reduced to a saddle wherever they have been dissected by the headward erosion of plateau streams, and rise to form mountains high-plateaus and peaks where the projecting spurs join them.

The mountains are the sites of deep valleys and deep ravines. Some of the east-flowing rivers have been dammed in their source regions, storing water to be used either for irrigation or for the generation of hydroelectricity. The high rainfall in the mountains averaging 2500 mm is taken advantage of and a number of huge reservoirs have appeared all along the length of the Sahyadris. Also sheltered in these valleys and broken terrain, are the tiny villages some of them inhabited by tribal population. The land, just west of the divide line, dissected and irregular, is known as 'Maval' and is the scene of a large number of Maratha forts. Because of heavy rainfall, the area was once well wooded but the increasing pressure of population and man's interference have led to rapid deforestation.

Fig. 7



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The Maharashtra plateau.—East of the Sahyadris, extends the Maharashtra plateau for a distance of over 700 km. The entire plateau can be resolved into a number of smaller plateaus and river valleys plains. Though strictly speaking all parts of the State have to be included in one basin or the other, these will include even the plateaus and hills.

The plateau proper shows declining heights both towards the eastern and northern periphery of the State. In the extreme eastern part, especially east and south of Nagpur, the average height of the Wardha-Wainganga basin varies between 250 and 300 m ASL, though occasional residual hills reach as high as 450 m. The Umrer hills, and the Chimur hills, forming the divide between Wardha and Wainganga rivers, attain a height of 418 and 450 m respectively. Elsewhere the land is much lower, and in the flood plains it descends to a level of 200 m.

The Tapi-Purna valley, an east-west furrow in the Deccan table-land, extending over a distance of over 300 km, shows a height variation between 200 and 300 m. The entire valley, asymmetrical in cross profile and covered with alluvium, stands in sharp contrast to the bare Deccan plateau in the south and the Satpura hills in the north. The plateau proper is drained by Godavari, Bhima and Krishna rivers and their tributaries. The broad valleys of these rivers bounded by 600 m contours are separated by flat topped divides which project eastward from the Sahyadrian range. From north to south, the plateau exhibits an alternate arrangement of hills and plateaus which form the divides and the river valleys. These are tabulated below:—

Satpura range
Tapi valley
Ajanta range and Ajanta plateau
Godavari valley
Harischandragadh-Ahmadnagar-Manjra plateau (Balaghat plateau)
Bhima river
Mahadeo range, Khanapur plateau
Krishna river

On the plateau the heights vary between 450 and 700 m ASL. The valleys are broad, bordered by 100—200 m high escarpments abutted by flat and extensive interfluves. Down these escarpments, locally known as ghats, are the pediments, gently inclined surfaces, particularly in dry areas, that merge with the terraces on either side of the stream channels. Extensive flat-topped hills, the relicts of horizontal lava flows, are seen almost everywhere in the landscape. Even the major divides are flat-topped with no convexity in their cross profiles. On either side, but more frequently on one side, they are characterized by a steep descent to the valleys. The outline of the flat-topped divides, and in consequence the escarpments, is crenulated as a result of the dissection caused on their margins by transverse gullies and ravines.

Between the tributaries of the principal rivers, which are more frequent in the west than in the dry core of the plateau, the divides are much lower and remain as mere swells. What is interesting is not only the relief represented by the differences in altitudes between the valley-bottoms and the tops of the divides, but also the variable heights of the interfluves from east to west. The flat surfaces at various altitudes are the old erosional surfaces well identified in the field. These are covered with a thin veneer of red soil in the west where the rainfall is high, but eastwards more soil is retained, though deficiency of water is a hindrance in its utilization. Further east as the interfluves become narrower and lower, the valley plains broaden out. This however, does not apply to Balaghat plateau which not only retains its width but even expands to compress the flood plain of Godavari at Nanded. Thus, the divides, much to the east, are higher than the places in the valley plains even close to Sahyadris. Ahmednagar, Aurangabad, Osmanabad, Latur and Udgir are all higher than Poona.

Topographically, there are two more areas in Maharashtra which command considerable heights. One is the Satmala—Ajanta chain that forms the southern rim of the Tapi trough, and the other is the 'Melghat-Gawilgarh hills' which is sandwiched in the Tapi-Purna fork. In all probability, the northern face of Satmala-Ajanta range is a fault scarp which has undergone considerable recession. It is in this scarp face cut through by Wagh river that the world famous Ajanta caves are located. The southern part of the Ajanta plateau is lowered and traversed by the tributaries and the sub-tributaries of Godavari river. The Satmala-Ajanta complex branches off from Saptashringi peak (1416 m) close to the Sahyadris.

with progressively decreasing heights, at Satmala (943 m), Sirsala (850 m) and Buldhana (646 m). About 120 km east of the Western Ghats, Ajanta hills are pierced by the tributaries of Girna river in the north and Godavari in the south, developing a saddle that could be called the Nandgaon saddle.

The Melghat complex overlooks the Tapi valley in the north and Purna valley in the south. The highest point of the plateau is Chikhaldra (1016 m), a hill station, originally a tribal settlement located in the midst of forests. The area is thickly forested. Plantation forests have taken the place of natural forests and Melghat plateau is one of the very important areas on which the forest department of Maharashtra depends for its supply of timber.

□ □

CHAPTER V

DRAINAGE NETWORK AND RIVER VALLEYS

A greater part of Maharashtra is drained to the Bay of Bengal by two of its major rivers, the Godavari and the Krishna, and the rest is drained to the Arabian sea either by the west flowing Tapi river, or by Konkan streams which emerging from the Western Ghats straightway join the sea. By a rough estimate, the areas drained by these rivers are as follows :—

T-5.1 *River Basins and their Areas in Maharashtra*

River	River basin Area (in Maharashtra) (sq. km.)	Area of the basin as per cent of the area of the State	Districts drained
Godavari ..	151,083	49.1	Nashik, Ahmadnagar, Aurangabad, Osmanabad, Bhir, Nanded, Parbhani, Jalna, Nagpur, Wardha, Yavatmal, Chandrapur, Bhandara, parts of Amravati, Akoaia and Buldana.
Krishna ..	74,069	24.24	Satara, Kolhapur, Sangli, Solapur and a small part of Ahmadnagar.
Tapi ..	52,226	16.96	Parts of Amravati, Akola and Buldana and Jalgaon and Dhulia Districts.
Konkan rivers ..	29,854	9.69	Thane, Bombay, Raigad, Ratnagiri (including Sindhudurg district).
Total ..		100%	

The Godavari, with its tributaries, drains the largest percentage of the area of the State. The river debouches from the Sahyadris at Trimbak, 25 km west of Nashik. Like any other river, Godavari also appears graded to its source. From the base of the escarpment, appearing on the eastern face of the Sahyadris, as a result of the headward erosion of the river, upto Nashik, there is no perceptible slope and its broad and flat valley appears a trickle. A few kilometres upstream from Nashik, a dam, locally called Gangapur dam is built across the river. From Nashik, the river follows a east-south-easterly course. This alignment is slightly disturbed east of 77°E longitude where the river swings and takes easterly course to resume its south-easterly trend once again at Nanded. Leaving Maharashtra, the river follows an easterly course for over 150 km.

The Godavari basin, occupying roughly half the area of the State, has a number of subsidiary basins belonging to its tributaries. The Pravara and Mula, both originating from Western Ghats in the upper Godavari basin, the Manjara river draining the Balaghat plateau, a terrain higher than the adjacent Godavari plain, and finally the Wardha-Wainganga and Pranhita basins in the eastern part of the State form part of the Godavari basin. Despite its length and a large basin area, the river has not assumed the importance it deserves, mainly because it traverses the dry core of Maharashtra where even the frequent droughts and poor agriculture have not been able to induce the people to harness the river till recently.

Flowing on the plateau, the Manjara river is inconsequential and runs dry during the non-rainy season. Its shallow shifting channel causes more erosion and loss of soil than enriching its flood plain. Pravara and Mula, the two right bank tributaries coming from the Sahyadris have the advantage of heavy rains in their source region, stored in large reservoirs, and thus their basins receive irrigation and are agriculturally the most developed parts of the State.

A characteristic feature of Godavari is its deep channel enclosed between its banks, which are more like embankments, and the narrow alluvial flood plain. Floods are not common in Godavari but a prolonged rain in the source region and the upper part of the valley, associated with depressions leads to a higher stage of flow exceeding the bankful discharge and the consequent floods. The valley from Nashik to Nanded and further, flowing all along on a basaltic base, behaves more like an evaporating dish with small depths of soil, except on the terraces on either side of the river which also hold water bearing aquifers. In areas not far from the Western Ghats, the river channel, but more particularly the valley in general, has witnessed enormous sedimentation. The sediments derived from weathering in the heavy rainfall areas of the mountains are brought by the tributaries over a steep gradient and dumped into the river which with a lower competence finds it difficult to absorb and transport it further despite a heavy discharge. This explains the enormous sediments in the right bank tributaries of Godavari close to the confluence.

The most important tributary-basin, that forms part of the larger Godavari system, is of Wardha-Wainganga rivers which join to form the Pranhita river which in turn joins Godavari near Sironcha in Chandrapur district. Wardha river emerges from the southern slopes of Satpura ranges, but more specifically from Betul plateau, east of 78°E longitude, and the Wainganga has its source in Seoni plateau. Wainganga drains a much larger area and has developed an extensive plain. The Wardha-Wainganga plain could be taken as an example of a peneplain. The river flowing over the crystalline and schistose terrain in a moderate rainfall area, has a wide bed virtually devoid of gravels with angular fragments occurring in lenses, in which the stream occupies a very insignificant width. The Wainganga plain down Bhandara is dotted with inselbergs, the most prominent among these being at Dongar Medha, a circular hill with a radius of about a mile or more. The residual with all the characteristic of a monadnock has a granite-gneiss base overlain with basalt. The rocks, badly jointed, have disintegrated into blocks which cover the slopes.

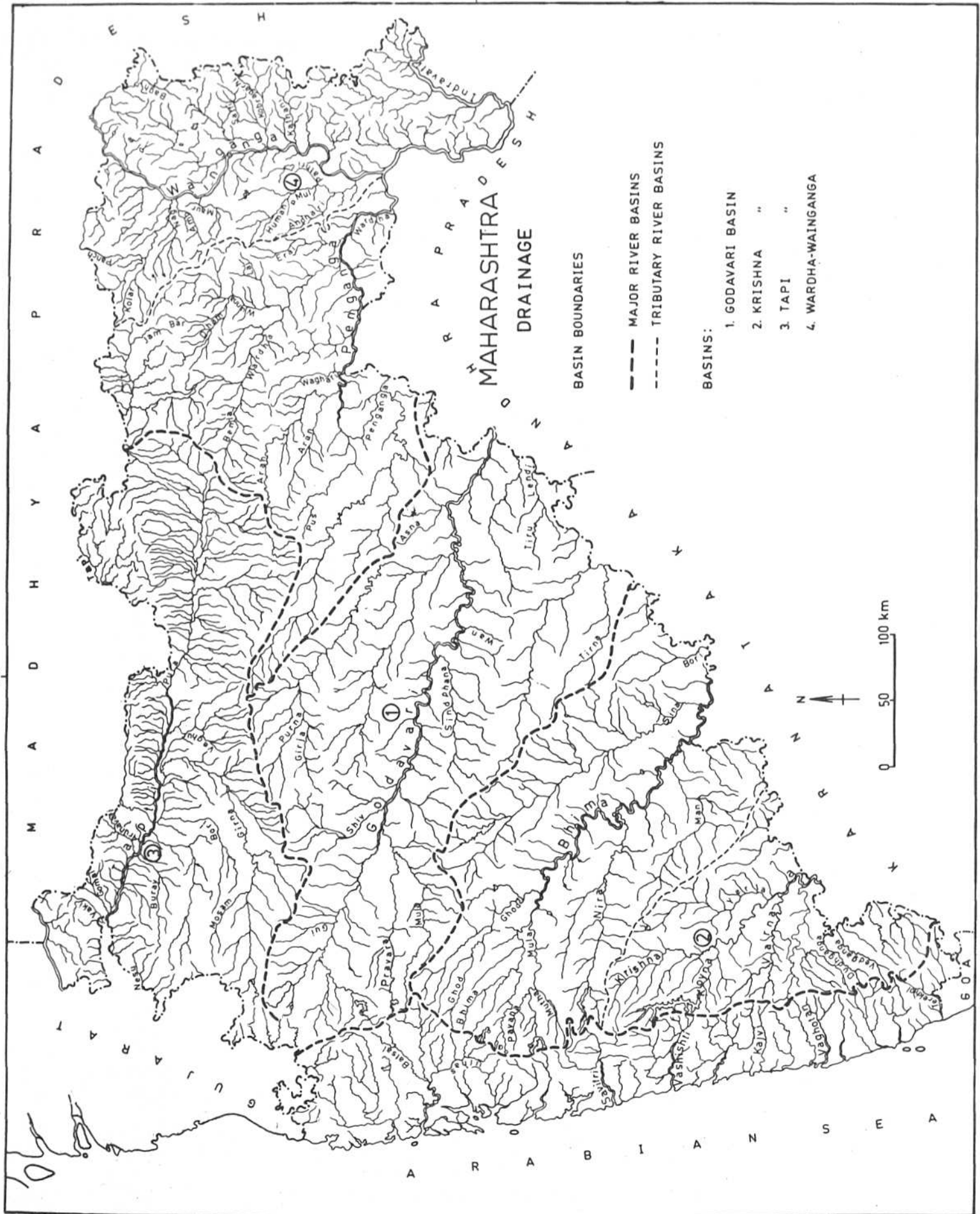
Krishna.—This is the next important river of Maharashtra after Godavari, emerging from the Western Ghats near Mahabaleshwar. The river follows a straight south-easterly course and enters Karnatak South of Miraj. It has a number of tributaries, the most important of which in Maharashtra is Bhima which enters Karnatak about 40 km South of Sholapur and joins Krishna in Raichur district on the Karnatak-Andhra Pradesh border. Bhima, though a tributary of Krishna, is equally important in the economy of the State. Its four tributaries, the Ghod, the Indrayani, the Mula-Mutha and the Nira, all emerging from the heavy rainfall Sahyadrian zone and making an inverted delta, a virtual funnel, in which all these streams join Bhima at Dhond, are important sources of irrigation and hydroelectrical power. Each has a reservoir in the source region. The reservoirs at the source of Indrayani and Mula feed the hydel-power stations installed at the foot of the Western Ghats escarpment. The reservoirs in the source region of Mutha and Nira feed the Mutha and Nira Canals. A major irrigation project with a dam on Bhima at Ujani is recently completed. This has enhanced the importance of the river which will become the lifeline of some of the dry districts of the State.

Bhima also called Chandrabhaga, is a legendary river, sacred to the followers of Vithoba whose shrine is located at Pandharpur where the river in its meandering course makes a crescent. Bhimashankar, a place at the source of Bhima, is equally an important religious place and the famous shrine of Bhimashankar, one of the "Jyotirlingas", is sited here.

Besides the tributaries of Bhima which, in turn, is a tributary of the river Krishna, the latter has many other tributaries, like Koyna, Panchganga, Dudhganga and Hiranyakeshi. The last one is a sub-tributary of Krishna and joins the Ghataprabha river. Of these, the Koyna which joins Krishna at Karad is too well known, linked as it is with the largest hydroelectric project of the State. The huge reservoir, the Shivsagar, with a 40 km north-south extent, is one of the largest in the State and occupies a longitudinal depression.

An important feature of Krishna basin in the state is the enormous amount of sedimentation. All the tributaries coming from the Western Ghats, the scene of excessive chemical weathering, bring large quantities of very fine sediments and dump them in the main river, besides depositing it in their flood plains. Thus the Karad-basin and the Panchganga basin have benefitted from an unparalleled sedimentation and have developed into some of the most productive areas of the State. The river Krishna has been tapped further by impounding its water in a reservoir at Dhoni, just about 15 km down its source. The reservoir gets the benefit of heavy rainfall at Mahabaleshwar.

Fig. 8



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Tapi.—Tapi, the only large river of Maharashtra joining the Arabian Sea, rises from Betul plateau in Madhya Pradesh. The river, occupying a trough, has a total length of 724 km. The valley and the large plain associated with it are drained by a number of parallel tributaries which join the main river at right angles, though in a few cases a downstream bend close to Tapi is observed. Thus, the entire length of the basin is divided into north-south segments of fingerlike basins of these transverse tributaries. The river breaches the Satpura range east of 76°E longitude and develops a gap named after the town of Burhanpur, the gap that has witnessed and facilitated centuries of north-south movement in India. Unlike Narmada, Tapi has an arched course with arcs projecting to the south in the eastern half and north in the western half. The valley has provided the route for a direct contact between the cotton area of Maharashtra and the Gujarat coast.

The tributaries of Tapi as well as Purna form an important element in the Tapi-Purna river system. Both these rivers receive countless number of tributaries. The most important tributary of Purna is Chandrabhaga that descends from Melghat. Among the left bank tributaries are Murna, Mun and Nalganga, the former passing through Akola and the last two draining the northern part of Buldana district. The most important tributary of Tapi is Girna, which originating from the Western Ghats flows due east and swings to north making a broad arcuate curve before joining the Tapi. Other left bank tributaries include Vaghur, Bori, Panjhara and Buray. The Waghur penetrates the Ajanta hills in its source region and provides an ideal site for the world famous Ajanta caves on its steep valley-side slopes. Panjhara, like Girna, flows from the Sahyadris and has developed Dhulia plain. The Khandesh plain owes its fertility largely to these two tributaries of Tapi, the Girna and the Panjhara. Arunavati, Gomai and Vaki are the important right bank tributaries of Tapi. Relatively short, these tributaries descend from the Satpura hills, pushing the line of Satpura further north and depositing the silt in the flood plain of Tapi.

The valley-side slopes, as well as the slopes on the transverse profile of the entire basin are very steep. In the longitudes of Nandurbar and Dondaicha, the surface descends from 300 m to 150 m in a distance of only 25 km, whereas in the longitude of Dhule, the same descent (300 to 150 m) takes about 50 km. The gentlest cross profile passes through Pachora where the 300 m contour is followed by 150 m contour on the bank of Tapi over a distance of 70 km. On the north, the Satpuras being only 25 to 50 km away from Tapi, the tributary streams behave like gullies. The asymmetrical but steep cross profile explains the abundance of gullies on both sides of Tapi.

The Konkan streams.—The short and joint-oriented Konkan streams flow east-west roughly parallel to each other, particularly in South Konkan. None of the Konkan streams has a course longer than 100 km. In North Konkan, the streams converge on Thana Dharamtar creek, guided by fracture and lineaments. In South Konkan, though the structural control persists, the streams are deeply incised. While Pinjal, Vaitarna, Bhatsal and Ulhas are the rivers north of Thana creek, Amba, Kundalika, Savtri, Vashisti, Shastri, Kajvi, Waghathan and Gad are the principal rivers in South Konkan. It is paradoxical that in this heavy rainfall zone, the coastal streams are reduced to a thread of water. The basins being small and the terrain being lateritic, the recharge from the ground water is limited. The rain water is easily and most expeditiously disposed off to the sea and after the rains the rivers turn dry. The mouth of these rivers are subjected to tidal inflow and the impact of tidal waters is felt for a considerable distance inland from the sea. None of the coastal rivers are navigable except in their lower courses, close to their month, firstly because of steep gradient but more because of inadequate draught.

The Konkan rivers, particularly the ones south of 18° north latitude, are deeply entrenched in the lateritic plateau which has a general height of 200 m. The valleys are gorge-like in which the stream channels occupy a very insignificant width. Close to the Western Ghat escarpment where lateritization has not proceeded and the landscape is dominated by rounded spurs covered with thick weathered mantle, these valleys are broad and more open. The rivers have found it easier to swing laterally and the recession of the valleysides through slope failures, slumps and undercutting has been speedy. The heavy rainfall of scarp zone is responsible for a considerable volume of surface runoff which has developed plains at heights comparable to the coastal plain. The funnel like arrangement of the tributaries in the source region accounts for a relatively high discharge in these rivers close to the Western Ghats. The anomalous occurrence of plains close to the Sahyadris, almost in the source region of Konkan streams, can therefore be attributed to excessive surface runoff and tributary development in an area devoid of any lateritic cover. The valley forms in Konkan are greatly influenced by the laterites which behave like permeable rocks.

The riverine plains are narrow and the cultivation is limited to the narrow (not exceeding even 50 m) river-side terraces and the coastal plains which enclose the river mouths.

The flow characteristics of the rivers of Maharashtra.—The largest river Godavari (1465 km. total length) with a catchment of 312, 812 sq. km. has an annual yield of 105,000 million cubic metres at Dolaiswaram where the river joins the Bay of Bengal. At Nanded, about 70 km. inside the State border, it has an annual discharge of 11,000 million cubic metres, but it has a much increased discharge at the confluence of Pranhita where the annual yield increases to 36,810 million cubic metres. Of the tributaries, Pravara discharges 1,980, Manjra 7,640, Purna—3,830 and Wardha-Penganga roughly 12,000 million cubic metres of water annually.

Krishna has a length of 1400 km, and only 26.8 per cent of its total catchment falls in Maharashtra. The river has benefitted greatly the lower parts of its basin in Karnatak and Andhra Pradesh. The two famous reservoirs, the Nagarjunsagar and Shrishailam, are located in Andhra Pradesh. In Maharashtra, it has a small reservoir at Dhom 10 to 15 km from its source, and one of its tributaries, the Koyna, is harnessed for the generation of hydroelectricity. The annual discharge of the river at Vijayawada is 67,675 million cubic metres, though at Sangli in Maharashtra the annual yield is only 14,700 million cubic metres. Of the tributaries, Bhima contributes 12,690 and Koyna a bare 3,964 million cubic metres of water. Krishna basin has the distinction of having one of the earliest irrigation works in Maharashtra. This is Nira canal constructed in the year 1846 with a dam on the river Yelvandi at Bhatghar.

Tapi river with a total length of 724 km has 79 per cent of its total catchment in Maharashtra. its total discharge in the gulf of Cambay is 17,982 million cubic metres, though at its confluence with Bori, north of Amalner, the annual discharge is only 10,649 million cubic metres—

T-5.2 *Length, Catchment Area and Discharge of some Rivers in Maharashtra*

Basin dimensions of some rivers of Maharashtra					
Major rivers	Tribu-taries	Length in km.	Catchment in sq. km.	Annual discharge in million cu.m.	Remarks
1	2	3	4	5	6
Godavari	..	1,465	312,812	105,000 (at Dowlai-swaram)	48.6 per cent of the area lies in Maharashtra.
	The Pravara	200	6,537	1,980	
	The Purna	373	15,579	2,830	
	The Manjra	724	30,844	7,640	
	Penganga	676	23,895	5,110	
	Wainganga	609	61,093		
	Wardha	483	24,087	6,800	
	Pranhita	113	109,077	36,810	Length after the confluence with Wainganga.
Krishna	..	1,400	258,948	67,675 (at Vijayawada)	26.8 per cent of the area is in Maharashtra.
	Bhima	861	76,641	12,690	Its basin extends beyond Maharashtra.
	Koyna			3,964	
Tapi	..	724	65,145	17,982 (at Kathor)	79 per cent area in Maharashtra.
	Purna	..	18,929	2,004	
	Vaghur	..	..	2,592	
	Girna	..	10,051	3,014	
	Bori	..	2,580	451	
	Panjhra	..	3,257	..	
	Aner	..	1,702	261	
Vaitarna	..	126	2,572	4,350	
Ulhas	..	122	4,637	3,014	
Savitri	..	80	2,257	1,467	

SOURCE.—K. L. RAO 'INDIA'S WATER WEALTH' ORIENT LONGMAN.

□ □

CHAPTER VI

CLIMATIC CONDITIONS

Forming a part of the tropical monsoonal lands, Maharashtra displays significant regional variations not only in thermal conditions but also in the amount and intensity of rainfall and the duration of the rainy season. Temperatures are usually the lowest in January, but the highest temperatures are not experienced during one and the same month all over the State. Temperature maxima occur on the Konkan coast in March, in upland Maharashtra in April and in the Vidarbha region and the hill stations of Western Ghats in May. On the coast, the sea breezes are gradually strengthened with the arrival of summer as a result of increasing pressure gradient, and heavily moderate the summer temperatures. The upland should show maximum temperature in May, the month that corresponds with the position of the sun, but the cloud bursts which invariably occur in late April or early May exercise a cooling influence. In late May, the clouds, a precursor to monsoons restrict the amount of insolation. In the eastern part of Maharashtra, these moderating influences are absent and the temperature maxima coincide with the passage of the sun.

July is the rainiest month in all parts of the State. Much of the rain is received from the south-west monsoons. The north-east monsoon brings rain only to the eastern part of Maharashtra comprising Amravati, Nagpur, Yavatmal, Chandrapur and Bhandara districts. December is the driest month in the eastern part and February in the rest of the State.

Temperature Conditions.—April and May are the hottest months on the plateau when the mean maximum temperature rises above 40°C over much of the central eastern part of the State. Nandurbar, Jalgaon, Solapur, Nanded, Parbhani, Nagpur, Akola, Amaravati and Chanda, each has a mean maximum of over 40°C in May. The mean monthly maximum of 42.8°C for Nagpur, Chandrapur and Jalgaon in May is the highest in the State. Some stations in Wainganga valley like Chandrapur, Sironcha and Brahmapuri attain a maximum of over 46°C in the month of May. In western upland Maharashtra, the temperature maxima in summer are more moderate. At Nashik, Pune and Kolhapur, the mean maximum of the hottest month does not exceed 40°C. On the Konkan coast, there is further fall in the mean maximum. For Ratnagiri, the mean maximum of the hottest month is only 32.7°C. Bombay, no doubt, shows a slightly higher mean maximum of 33.3°, obviously an influence of urban and industrial landscape.

December and January are the coldest months, December in the Central and Western Maharashtra plateau and January in Konkan and Eastern Maharashtra. The mean minimum of the coldest month on the coast varies between 16 and 20°C. (19.4° for both Ratnagiri and Bombay). It varies between 11 and 15°C on the plateau (12.0° for Pune, 12.3° for Ahmadnagar, 12.7° for Aurangabad, 14.9° for Kolhapur, and 11.7° for Malegaon) and is relatively low in the eastern part (Chandrapur 12.2°, Akola 12.6°, Nagpur 12.1° and Parbhani 12.7°). An exceptional feature of the cold winter nights are very low temperatures in Jalgaon and Nanded, both located in the valleys. Conceivably, they suffer from temperature inversion when the cold plateau winds descend to the valleys. Local relief also makes a difference. A lower temperature during the winter nights at Ahmadnagar (m. min. 12.5°) than at Solapur (15.0°) can be explained only by higher altitude of Ahmadnagar.

The range of temperatures.—The range of temperature on the coast is low, both diurnal as well as annual, in contrast to the range on the plateau. The daily range of temperature all over the State is least in the month of July. The amount of solar radiation received in July is relatively less as compared to April or May, firstly because of cloud cover and secondly because of a considerably amount of heat energy being spent in evaporation from wet surfaces. Thus, the day temperatures come down and at the same time the night temperatures become more steady because the loss of terrestrial heat is also prevented by water-vapour present in the atmosphere and the clouds. There is thus a green house effect produced by monsoonal weather that avoids extremes of temperature.

The increase in the daily range of temperature from July onward reaches a maximum in December or January. It does not coincide with temperature maxima but with its minima. January shows the maximum daily range both on the coast as well as on the plateau, though the strength differs

appreciably. The daily range on the coast, in Bombay and Alibag, is around 10°C, but on the plateau it is almost double, varying between 15 and 18°C. Hilly places like Mahabaleshwar show a low range, less than even 10°C in December, because of low day-temperatures. Both, the Western Ghats and the coast, show lower daily, monthly as well as annual range of temperature as compared to the stations on the plateau. The temperatures in January on an average, are 5 to 8°C higher on the coast as compared to hill stations.

The annual range of temperature is highest in the eastern and northern part of the State where the summers are relatively hotter and winters colder. The coastal stations like Ratnagiri and Bombay show an annual range of 5° whereas the places on the plateau have much higher range of temperature varying between 13 and 15°C, with the exception of Mahabaleshwar and other hill stations which, with lower temperatures, behave like the coastal stations in so far as the range is concerned.

Rainfall

Far greater contrasts are observed in the distribution of rainfall than of temperature. The rainfall in the State varies from 450 mm in the driest part to over 6000 mm in the hilly areas of the Western Ghats. The coastal area receives 2 to 3000 mm rainfall, the Western Ghat hills 4 to 6000 mm, the western part of the plateau 7 to 800 mm, the dry core 4 to 500 mm, the eastern part of the plateau 7 to 800 mm and the eastern margin of Maharashtra 12 to 1500 mm rain.

Leaving aside the Konkan, the Sahyadris and the Wardha-Wainganga basin, most other parts of the State receive less than 1000 mm rain. Much of this rain is brought by the south-west monsoons during summer, and about 90 per cent of the rain falls in the 4 monsoon months from June to September. Some rain is received in October and November associated with storms. The amount of such rain does not exceed 20 per cent. The October rains are very vital in the agricultural economy of the region. The Wardha-Wainganga basin receives some rain from the north-east monsoons in winter months which does not exceed 1/10 of the total rain in the area.

Over much of Maharashtra, the summer monsoons burst around 10th June. They arrive a little late, around 15th June, in eastern Maharashtra. On an average, July is the rainiest month with the largest number of rainy days. This applies as much to the dry part of Maharashtra as to the rainy hilly and coastal tracts. The coast receives about 2000 mm of rain which progressively increases to the south, with 2029 mm at Bombay suburban to 2617 mm at Ratnagiri. As expected, on a west-east traverse, the rainfall increases inland from the coast on the same latitude till the Sahyadrian divide. All the places, a few km. inland, show higher rainfall. Devrukh (17°-03N.) receives 3679 mm as compared to Ratnagiri (16°-59N) with 2617 mm. Malvan (16°-02') receives 2154 mm of rain while Kudal (16°-01') with an inland location enjoys 3082 mm of rains. Even in case of Bombay, the Kurla observatory, a slight inland location, receives 2029 mm of rain as compared to 1801 mm at Colaba. Moving over the ocean, as the monsoons approach the coast, they suffer from a slight retardation in the condensation process, till the winds start ascending to cross the Western Ghat barriers and thus bring orographic rains. Even the Konkan plateau is about 2-250 m high and requires some ascent from the wind. In fact, west of the Western Ghats, the amount of rainfall varies with the latitude and the height of a place. A higher place invariably gets more and a place farther north, less rain. In some situations, one may compensate for the other. Matheran, (18°-59' N, latitude) with a height of 707 m. ASL, receiving 5167 mm annual rain, presents a contrast with the coastal station of Kolaba (18°-54') that receives only 1801 mm of rain.

The zone of heaviest rainfall coincides with the Sahyadrian mountainous zone. The stations located in this zone receive 3 to 6000 mm rains. Igatpuri, Lonavala, Mahabaleshwar and Gaganavda, all receive over 3000 mm. of rain and the last three receive more than 6000 mm of rains. The rainiest place in Maharashtra is Amboli, in Ratnagiri district, nested in the Sahyadris and overlooking the Konkan. Occupying one of the southernmost locations in Maharashtra and directly exposed to the South-West monsoons, it receives 7477 mm of rain. Surprisingly, the station receives more than 10 mm of rainfall in each month except February and March.

The decline in the amount of rainfall east of the Sahyadris is quicker than its rise from the coast. The heavy rainfall zone gives place to a near semi-arid belt hardly 100 km east of the divide. The Sahyadris really cast their shadow to create a rain shadow area. In Poona district, Lonavala on the Sahyadrian divide receives 4303 mm of rains which decline to 1124 mm at Vadgaon hardly 25 km to the east, and 661 mm at Poona, 60 km from the divide. Further east, the places in the dry core of Maharashtra receive less than 500 mm of rains. Jejuri, Baramati, Sangamner, Dhond, Akluj, Phaltan—all receive less than 500 mm of rain. East of 75° longitude, the rainfall increases again, but the increase is gradual. The districts of Khandesh and eastern Vidarbha receive 8 to 900 mm rain while the eastern extremity of the State receives 14 to 1500 mm.

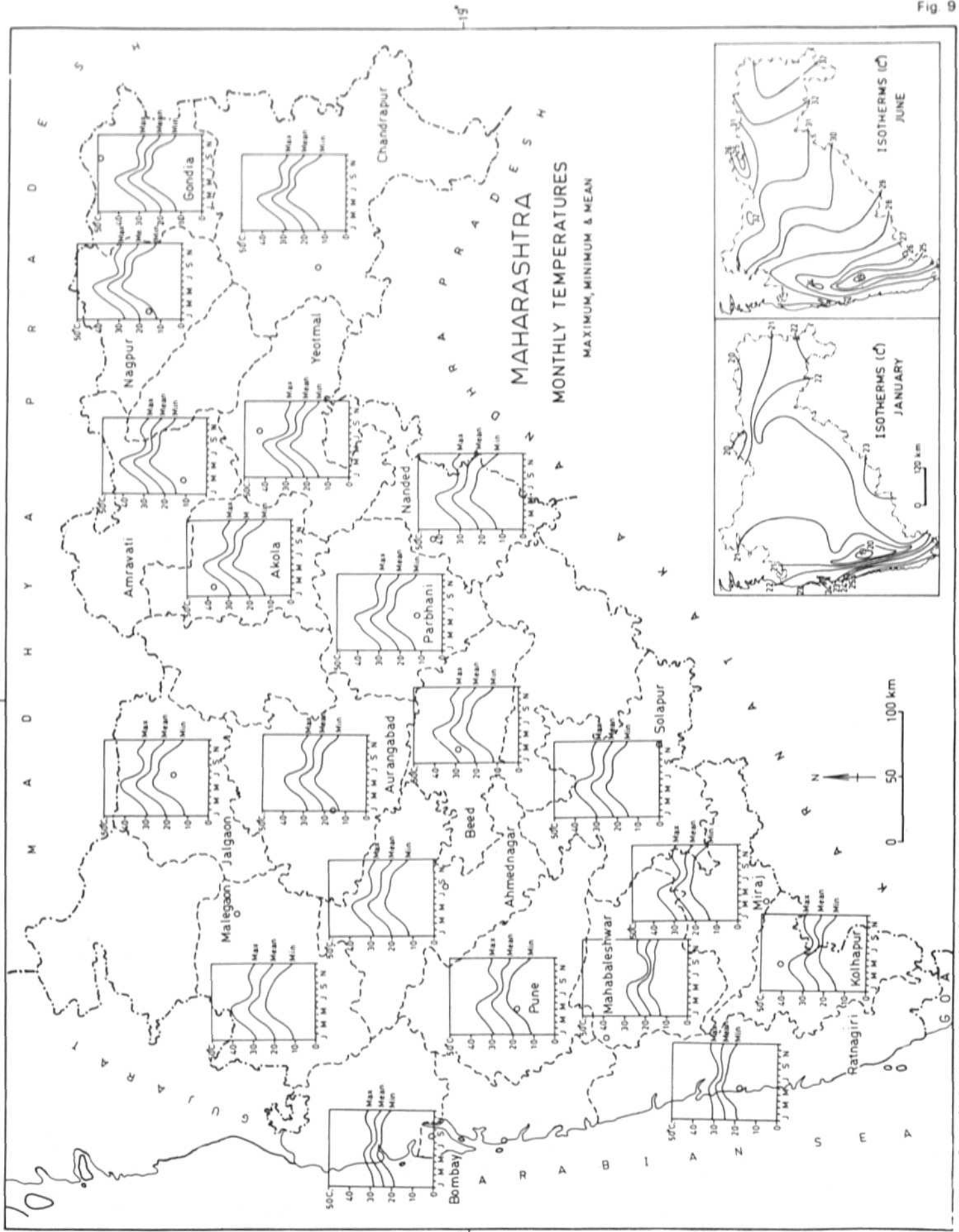
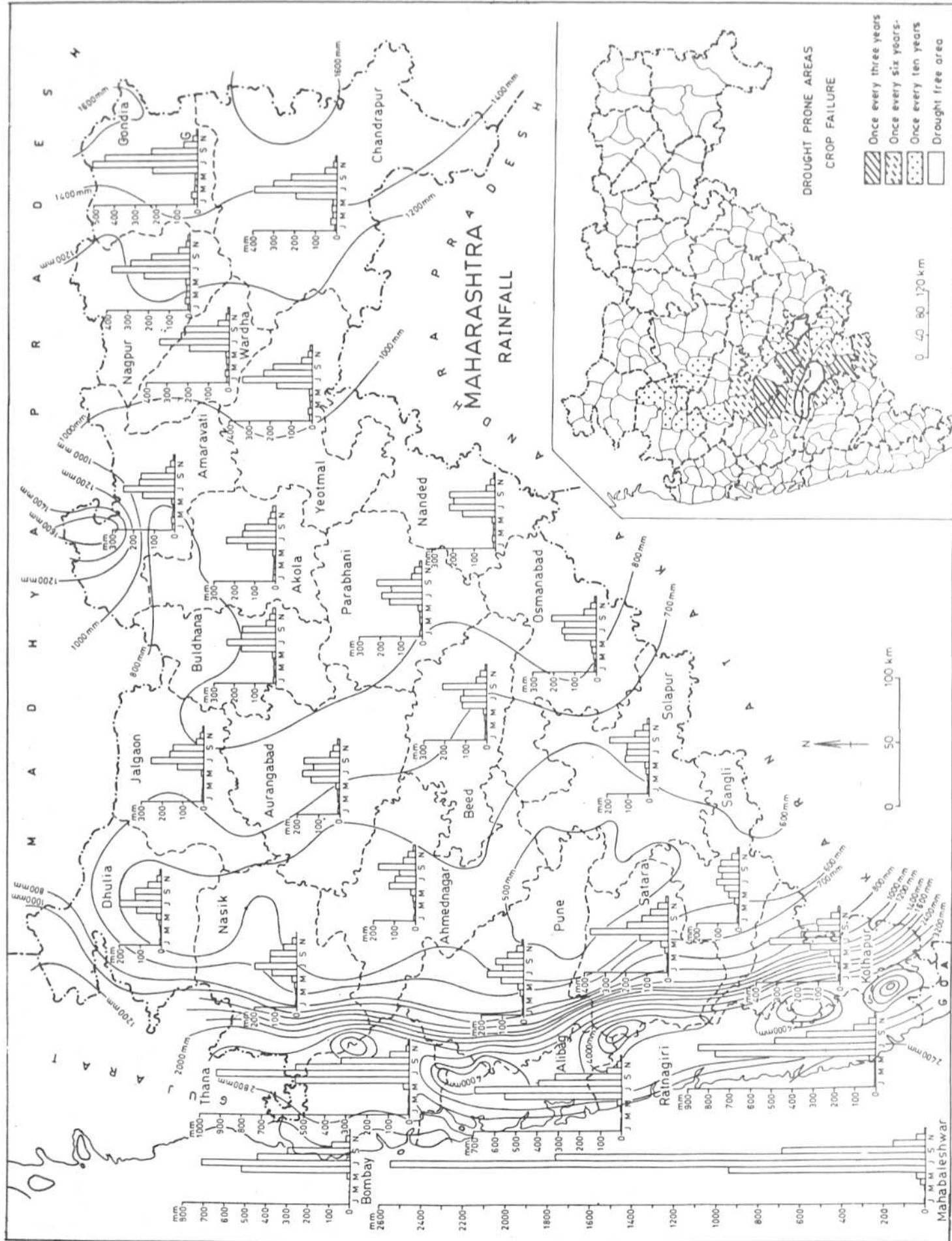


Fig 9

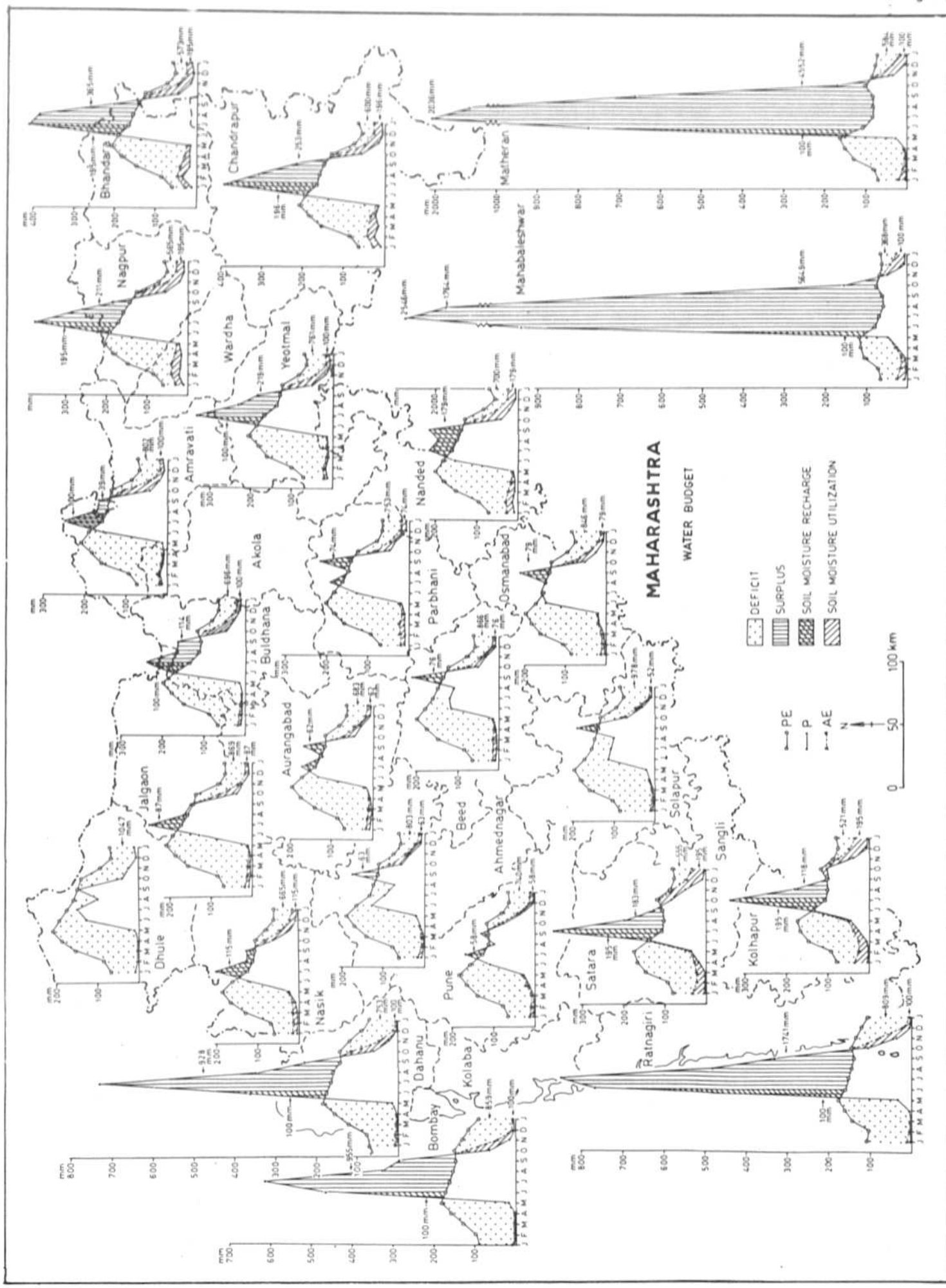
Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1965.

Fig. 10



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig 11



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1986.

Thus, from west to east, there is an irregular rainfall profile in the State, a peak coinciding with the heavy rainfall zone of the Western Ghats, a steep drop coming with the rainshadow and its degeneration into semi-arid tract, followed by a gradual rise in Vidarbha districts where it is steady till one reaches in the extreme eastern part of the State with a moderately high rainfall.

Seasonality of rainfall.—The rainfall regime in different parts of Maharashtra is not identical. The contrasts are not only quantitative but qualitatively significant, and have far reaching consequences on the agricultural practices of the State. While it is true, that more than 85 per cent of the rain falls during the five monsoon months, June to October, the winter rainfall, though scanty is equally important. Regardless of relief, Maharashtra could be roughly divided into two halves on the basis of rainfall regime, the western and the Eastern. The western half, which includes the coast, the Western Ghats and the western part of the Maharashtra plateau, receives very little rain from December to March. In this part, February is the driest month. As one moves east, the amount of winter-rains increases, and February assumes the importance as a month with second rainfall maximum of the year. The driest month in the eastern part of the State is December. December is the month that divides the tapering influence of summer monsoons from the onset of the winter (north-east) monsoons. Eastern Maharashtra experiences winter monsoons from January to March, with only a moderate rainfall of 50 to 60 mm. In February Bhandara receives 34.8 mm, Chanda 25 mm, Nagpur 23.4 mm and Amravati 16 mm of rainfall. The winter rains of eastern Maharashtra do not penetrate deep inside Maharashtra and Western Maharashtra hardly receives any winter rains.

Duration and intensity of rainfall.—There is a significant association between the amount of rainfall and the number of rainy days. The intensity of rainfall, measured in terms of rainfall divided by the number of rainy days, is higher in places with greater rainfall and a larger number of rainy days. No part of the State has less than 30 rainy days in the year with the highest number, 124, at Amboli, which also has the distinction of enjoying the heaviest rainfall in Maharashtra. On an average, the Konkan coast has 80 to 100 rainy days in a year. The Sahyadris have 100 to 125, the plateau 30 to 60 and the Eastern Maharashtra 50 to 75 rainy days in the year. The number of rainy days is not always the highest in July which is the rainiest month all over, and in some places August has as many rainy days as July.

A significant fact about rainfall is its distribution over the four monsoon months. The onset of the monsoons is a lingering process and the rainfall in downpours and drizzles continues for a week or ten days. After the July rains, there could be a dry spell in August which is most damaging to the crops. If the rainfall in July and August is above average, risk of Kharif failure is minimized. In September, the rains occur in drizzles with occasional heavy rains. The retreat of the monsoons in October is accompanied with thunder, lightening and rains. These rains could be quite heavy bringing considerable moisture to the soil and the growing crops. A high October temperature, a feature of the monsoon climates, is responsible for a downpour comparable to the rains associated with the onset of monsoons. November rains, also called 'Diwali rains' in Maharashtra, though not very heavy are very vital. These reinforce moisture in the soil that is a critical requirement for rabi crops.

Water-budget

The enclosed map depicts water budget of different stations in the State. The map, not as common as the temperature and rainfall maps, attempts to examine the relationship between the amount of rainfall and evapotranspiration and surplus or deficit of moisture that might result at a station. If the amount of rainfall is less than the potential evapotranspiration, naturally there is a deficit, but if on the contrary, the amount of precipitation is in excess of the evapotranspiration, there is a surplus which gets stored in the soil and is known as soil-water-storage which is utilized at a time when the evapotranspiration increases.

In no part of Maharashtra the soil has enough water storage to last for the whole year. Even the rainiest of places like Mahabaleshwar and Matheran do not store enough water in the soil to meet the demands of evapotranspiration during the dry months. The water deficit is felt from November to May in all parts of the State, and in some parts, not even a single month shows a surplus. On the other hand, even in dry areas, some months do have a rainfall surplus but the excess of rainfall is spent in recharging the dry soil and a surplus does not materialize.

In Konkan and the Western Ghat regions, as much as in other parts of the State, the winters are dry and the soil is devoid of moisture. This is particularly true of Konkan. The soils in the Sahyadris do have moisture but inadequate to meet the demand of evapotranspiration. Thus, whatever moisture remains in the soil is utilized, and April and May are the months when virtually no moisture utilization from the soil takes place. The deficit in April and May is of the order of about 100 mm at Mahabaleshwar and 150 mm at Matheran. With the onset of monsoons in June, the deficit is made up, the soil moisture recharge takes place till the soil attains its field capacity, and soon a surplus is created which results in surface runoff.

In Maval which comprises a 40 km wide rugged and dissected zone consisting of spurs, valleys and the irregular terrain of Sahyadris, the shrinking rainfall does not permit an absolute surplus, but only a soil storage by rainfall excess over evaporation. The accumulated deficit is as much as the field capacity of the soil which has to be eliminated before surpluses in the soil could be created. Dhule, Nashik, Pune, Satara and Kolhapur—all have a deficit of over 500 mm in the month of January. Dhule and Akola have a much higher deficit because of low altitude and higher temperatures.

Paradoxically, the coastal areas show a much higher deficit than the plateau. High temperatures resulting from coastal location cause greater evaporation, and the surplus is quickly exhausted. Since whatever the surplus, the maximum soil moisture storage will not exceed its field capacity. Mahabaleshwar shows a surplus of over 5649 mm but much of it goes as surface run off, and the heavy downpour of the rainy months is no help in ensuring moisture all the year round. If the rainy parts of the State show a surplus of rains for five to six months, it is because the soil in these parts does not only get fully recharged but has enough surplus which saves the soil moisture from being evaporated and the field capacity of the soils is maintained till the end of the rainy season. In areas of low rainfall like Central Maharashtra (Pune, Ahmadnagar, Osmanabad, Solapur and Parbhani), the process of recharge does not reach a stage to produce a surplus, or even to fully saturate the soil to reach its field capacity, since the latter has to be acquired only by the surplus of precipitation over the losses caused by potential evapotranspiration.

□ □

CHAPTER VII

SOILS

The soils of Maharashtra like the soils of India have been variously described. Individuals and institutions have grouped and described the soils of the State as warranted by their own needs. The State, however, is commonly known for its black cotton soil that covers the entire State of Maharashtra. A closer scrutiny will show that the fertile black cotton soil, popularly known as 'regur' is confined to only the valley plains, the worn out and almost levelled up low divides, foot hill plains and the medium height surfaces of planation i.e. old plains which now appear as plateau tops. The rest of the area—and it is almost $\frac{3}{4}$ of the area of the State—carries a soil cover which presents contrasts in its composition, colour and texture, besides depth and the nature of its profile.

One may even hazard a rough generalization by saying that since the parentage is the same, most soils having developed from basalt, it is the topographic situation and the climatic characteristics which work as major influence on soils. Climate is preeminently important in initiating the process of weathering and soil formation. Topography, on the other hand, influences the retention, removal or deposition of soils in certain specific areas.

The soils of Maharashtra are grouped into the following broad categories :—

- (1) Coarse shallow soils
- (2) Medium black soils
- (3) Deep black soils
- (4) Clay loam
- (5) Laterite and lateritic soils
- (6) Coastal alluvium
- (7) Reddish, yellowish and brown soils
- (8) Brown grey soils.

This classification adopted by the department of agriculture, Government of Maharashtra, has neither a genetic basis nor follows an accepted international soil classification. It has, none the less a practical advantage in being more amenable to areal mapping for agricultural planning, since each class corresponds to a topographic situation. For instance the coarse shallow, medium black and deep black soils roughly correspond with high plateaus, low divides and river valleys.

A simpler classification would, perhaps, be to divide the soils into 3 broad categories. These may roughly correspond to climate, and may represent the zonal groups of Marbut of USA or Dokuchaev of USSR. These could be :—

- (1) Red, brown and lateritic soils of high rainfall areas
- (2) Black, dark and grey soils of moderate and low rainfall
- (3) Coastal and other river alluvium, usually dark grey

Thus, the coarse shallow, the medium black or deep black soils are the topographic variants of the black, dark, and grey soils. The lateritic and reddish brown soils of the Sahyadris are grouped into the red, brown and lateritic soils of high rainfall areas, and the coastal alluvium and the clay loam and brown grey soils are included into coastal and other alluvium. Since the classification adopted by Agriculture department is quite familiar it is discussed here.

1. *Coarse shallow soils.*—Such soils occupy the major divides, with the exception of Western Ghats. The Ajanta plateau, the Balaghat plateau and Mahadeo range carry such soils. Because of the paucity of rainfall, weathering in these areas is retarded and so is leaching, with the result that coarse

shallow soils with very little humus occur on these plateaus. Occupying the divides, these areas have not received any transported soil. The thickness of such soils is restricted by the depth of weathering, which does not exceed 40 cm. In the western part of these plateaus, where the rainfall is slightly higher, the thickness is greater and close to water courses it reaches a depth of even a metre. These soils occupy a zone having 600 to 750 mm of rains, and are neutral or alkaline in reaction. The moisture storage in these soils is limited because of their shallow profile and a coarse texture which does not permit much capillary water. The free water is easily drained or evaporated. These support only rainfed crops like *bajra*, 'nachni' and 'warai'.

Medium and deep black soils.—The medium black soils occupy the eastern margins of the plateau divides which are either lowered, or replaced by erosional plains, either as a result of the recession of the plateau margins or because of dissection by the tributaries of some major rivers. The medium black soils, occupying the largest area of the State grade into deep black soils, and differ from the latter in their depth of the profiles, colour and texture.

The deep black soils.—Popularly known as black cotton soil, these occur in areas of moderate rainfall. Usually, these soils occupy the valleys, terraces, flood plains and lower parts of almost all basins being enriched heavily by the sediments brought from the slopes by wash, creep and innumerable small water courses. Their colour is much darker than the medium black soil, and thickness of the profile much deeper. These soils also have a larger fraction of clay. Devoid of any leaching, since they occur in areas of moderate and low rainfall, and poor or no chemical weathering, the soils have not suffered from any loss of bases or concentration of iron or aluminium in their upper horizons. Thus, they have an alkaline reaction and are known for their high content of lime (1 to 5%) and other bases. The lime takes different form. It may occur as nodules in the profile or as a band. Despite their dark colour, the deep black soils are poor in organic content and even nitrogen but do not show any deficiency in potash and phosphates. The pH of these soils is between 8 and 8.5, containing .2 to .3 per cent of soluble salts.

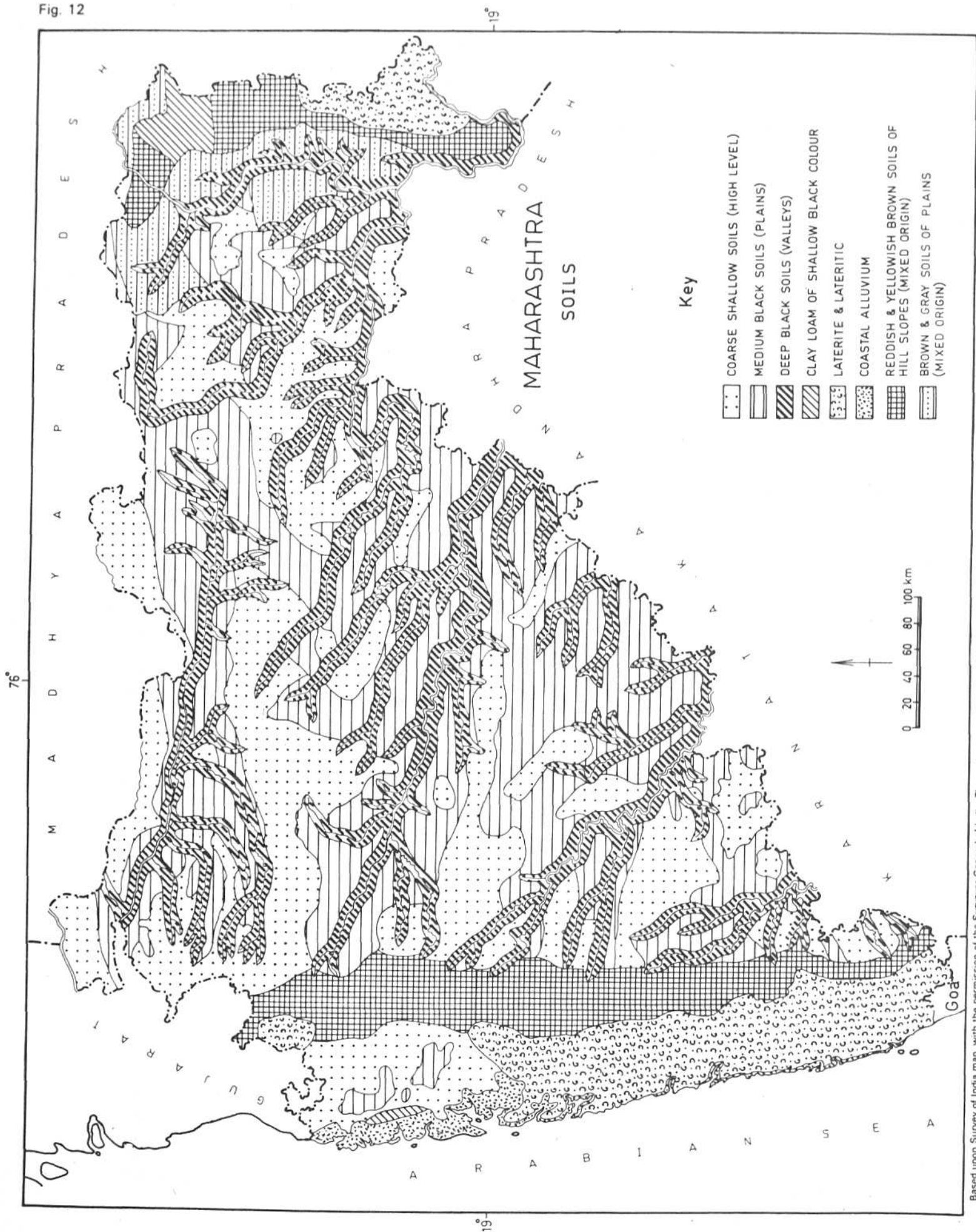
As suggested earlier, the coarse and the medium and deep black soils are the topographic variants of the same type of soil, changing their texture, colour, lime content and the thickness of profiles. The deep black soils in the river valleys could as well be called alluvial soils as they represent an accumulation of transported soil by rivers. The transported deep black soils are richer than the residual black soils. The availability of irrigation from the ground water in the river terraces has made these valley soils a very dependable avenue of agriculture. These are the soils that grow rabi jowar, cotton, wheat and a variety of cash crops, including sugarcane depending upon the availability of irrigation.

Clay loam.—This soil is shown at two places on the map—one patch in Thane district and another in Bhandara. Both these areas receive about 1500—2000 mm of rains. The soils are clayey. In Bhandara these are known as 'kali', the black, and in Thane district it is the soil of the paddy fields. The soils are similar to the medium black soils, but being in more rainy parts, they make good paddy fields.

Lateritic soils.—There is voluminous literature on the occurrence and properties of laterites and lateritic soils. Maharashtra presents some of the best examples of laterite and lateritic soils. Laterites are the products of chemical weathering with excessive leaching of bases and a surface concentration of iron, aluminum and even silica. This happens in tropical climate with a rainfall of over 2500 mm and a well defined dry season. The Sahyadris and Konkan, both offer excellent sites for lateritization. Mahabaleshwar, Panchgani and other high plateaus like Matheran and the entire Ratnagiri district have a considerable thickness of laterite. Presence of iron in the parent rock is a prerequisite for the development of laterites, and this is satisfied by basalt only too well.

The particles of disintegrated laterite and the highly leached red soil, together give rise to what is known as lateritic soil, a soil that has a tendency to develop a crust after the rainy season. The processes of surface concentration of iron oxides are manifold and still debated. The soil is highly acidic showing a pH value of 5 to 6, devoid of all bases, but rich in nitrogen. The soils support forests and inferior varieties of millets. As for laterites, it is better to treat them as rocks. lateritic soils occur in Ratnagiri district and on the high plateaus representing the crestline surfaces of Sahyadris and their slopes. These are the least productive soils of the State. Since these occur in heavy rainfall areas with very rugged terrain, they have not attracted cultivation and are either desolate plateaus or carry jungle type vegetation in Konkan.

Fig. 12



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Coastal alluvium.—The alluvium brought from the coastal river basins and deposited on the coast is known coastal alluvium. Generally, these are associated with the mouths of the streams, or their estuarine plains. Some of these coastal alluvial plains have evolved out of the ancient abrasion platforms that were subjected to the planation by sea. The retreat of the sea exposed these surfaces, which in due course were spread with a mantle of fine silt brought from the hills and the plateaus inland. The streams or the gullies that brought these silts are short, and the explanation for the fine texture of these soils lies in deep chemical weathering which transforms the Deccan basalt into clay and clayey weathered material, subjected as the entire Western Ghats are to heavy rainfall. Irrespective of gradient, therefore, the coastal streams and small water courses transport only fine and very fine silt, since rock fragments and gravels are not produced by weathering in the Sahyadrian zone, that is drained to the Arabian sea, finds its way to the coastal alluvial plains and enriches these soils. Since much of this alluvium is derived from the weathered mantle from which the bases are already leached, the percentage of soluble salts in these soils is relatively low. These soils have a neutral reaction with a pH value ranging between 7 and 7.5, and are used for growing paddy, taking advantage of the flat surface and a rainfall varying between 1800 and 2500 mm. The Dahanu-Dahisar plain, the Kalyan-Ulhasnagar plain and the Panvel-Uran plain around Dharamtar creek, and a number of tiny plains on the mouths of the hill streams have an apron of coastal alluvium.

The depth of coastal alluvium does not exceed 1 to 1.5 m. In places one comes across even rock exposures. The addition of organic waste over the years has made the soil even black at places. The sea incursion has a very important influence on the soil, particularly during the monsoons. The south-west monsoons not only increase the height of the waves submerging the coastal areas but also obstruct a free discharge of river water into the sea. The retarded drainage, due to a temporary rise in sea level and tidal incursions, has changed part of the coastal plain into saline wastes. Coastal alluvium could, therefore, also turn into a saline soil. Beyond the tidal limit, some of the best paddy fields are located in the coastal alluvial soils. Thane, Kolaba and Ratnagiri are the three districts that have such soils.

Reddish, Yellowish and Brownish soils.—Such soils occur in the eastern part of Chandrapur and Bhandara and in the Sahyadrian range. These have partly the properties of the lateritic soils. Excessive leaching resulting in the loss of alkali cations and the concentration of sesquioxides are the basic features of the pedogenesis of these coloured soils. The soils retain their colour even after being transported, since the process of leaching continues as long as they exist in areas with over 1500 mm rain. Being not very productive, these were the unfavoured soils of the early settlers permitting the growth of forests. In the forests of Chandrapur, eastern Maharashtra and the Western Ghats, the reddish brown soil is the rule. The divides, reaching a stage of near planation are occupied by forests. The extensive teak stands of eastern Maharashtra and Western Ghat region thrive on this inferior variety of soil which is neither fertile nor retentive of much moisture. In both parts of the State, the eastern part as well as the Western Ghat region, these soils usually occupy undulating grounds. This has to be noted that the schistose rocks of Wardha-Wainganga valley is rich in iron, comparable to Deccan basalts, which constitute the Western Ghats in Maharashtra. This explains the soil colour in Chanda-Bhandara area.

The Brown gray soils.—The outer flood plains of Wardha-Wainganga carry a brown gray soil which owes its characteristics to a parentage that is dominated by granite-gneiss rocks of pre-Cambrian. Unlike the soils having reddish colour in the high rainfall area, and black colour in the low rainfall area of the plateau, the soils here are neither red nor black but have a gray appearance. Absence of iron and a moderate rainfall have produced this kind of soil. The outer plains of the basin are not subjected to annual inundation, and thus year-after-year enrichment of these soils does not take place. These are not as fertile as the black soils, containing a high percentage of calcium carbonate and other soluble salts, deficient in iron and potash, and characterized by a low percentage of clay.

Saline-Alkaline soils.—Known as 'Solonet', these intrazonal soils usually occur in relatively dry areas, irrigated areas and areas suffering from tidal incursions. In most cases, appearance of alkalinity on the surface is the main property of these soils. Any soil containing more than 0.5 per cent soluble salts is considered as saline. With the soluble salt content exceeding 0.5 per cent, the soil is rendered unsuitable for the optimum growth of crops. If the percentage of soluble salts is less, say around 0.2 per cent, one may call such soils alkaline.

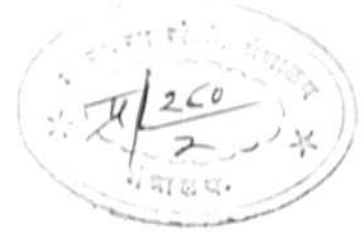
Such soils occur on the coast where the tidal incursions have rendered some areas of Kolaba and Thane districts highly saline. In irrigated areas of Pune and Ahmadnagar districts, the canal irrigation has raised the water table in some parts and evaporation through the capillaries brings the salts in solution to the surface where they get precipitated. Thus, at many places, in irrigated tracts one comes across alkaline efflorescence.

Functional incongruity between soil and rainfall in Maharashtra

The topography, the rainfall, and the distribution of soils do not ideally coincide to provide the best possible conditions for agriculture. The best of soils in the State suffer from inadequacy of rainfall and frequent droughts. The heavy rainfall areas in Western Maharashtra, are devoid of good fertile soils either because of the dissected hilly terrain or excessive leaching and lateritization. The thin soils on the plateaus and slopes can be used only for growing rainfed crop. These are not suitable for crops like paddy and jowar. At best, inferior millets can be grown. The black cotton soils which occupy the largest area in Maharashtra unfortunately occur in dry tracts. This seriously limits their usefulness. With more rainfall, their utility would have increased several fold. Thus, this most fertile soil can be harnessed only with the help of irrigation. In the absence of irrigation, hardy grains like jowar is grown wherever the soil is thick. The scene is gradually changing with the coming of canals in many parts. Wherever irrigation has been made possible, these soils have been able to sustain crops like sugarcane, wheat and other cash crops, such as grapes, bananas and oranges. Black soils unfailingly promote agricultural prosperity if irrigation is available.

With increased rainfall and a flat terrain, wherever alluvium has accumulated, paddy is cultivated. This is the case with Konkan, Chandrapur and Bhandara districts.

□ □



CHAPTER VIII

FORESTS OF MAHARASHTRA

There is hardly any doubt that the forests occupied a much larger area in Maharashtra in the past, than today. The expansion of agriculture, grazing and other activities of man, consequent upon an increase in population has led to an ever increasing encroachment on the forests and a resulting shrinkage of their areas. Today, the forests occupy only the hilly, rugged, and inaccessible areas with poor and infertile soils which are unsuitable for agriculture, and if cultivated, will yield only marginal returns. Thus, agriculture the main sustenance of the people in this country, gets the first priority and claims the best land. For long, forests were treated with certain degree of indifference, and their existence implied a hostile inhabitable domain fit only for wild life. They were encroached upon only for food, fuel, fodder, timber and medicinal plants. They were exploited but not maintained and protected.

The advent of British rule in India saw a systematic and intensive exploitation of forests. The conservation and development policies were nominal, and intended to promote the growth of timber wood. The forest policy, if any, had a mercantile orientation. Preservation of nature was not seriously considered, and the appreciation of an ecological damage, that might result as a consequence of excessive exploitation, was farthest from the mind of the planners. This led to the neglect of natural forests and the focus shifted to plantation forests that could provide sustained yield of commercial timber. It is only during the a decade or two that the ecological deterioration in many parts of the world has started exercising the minds of naturalists, and giving forests the importance that they deserve. Today, they are valued much-more for their pivotal role in preserving the ecological equilibrium than as an economic resource.

According to the statistics provided by the forest-department of Maharashtra, the forests in the State occupy 66,725 sq. km. of area. This forms over 21.7 per cent of the area of the country under forests. Both these percentages, for India as well as Maharashtra, are deceptive. A large part of the area classed as forests is not only under very sparse vegetal cover but even barren. Both, forest and revenue departments are guilty of showing exaggerated figures of areas under forests, which are far from reality. There is no definition in terms of the volume of vegetal material or the frequency of trees per unit area to include a patch of land under forests. What these departments provide, is the legal status of the land-use category as shown in records. It will be a pertinent exercise for the forest department to adopt an appropriate definition and undertake a survey to find out the acreage actually under forests and not the land classified as forests.

The forested area in the State is distributed in three zones, the western, the northern and the eastern. These correspond with the three relatively heavy rainfall zones and the mountainous areas. The western zone includes the Western Ghats and its foot hills; the northern zone comprises the Satpuras and the Melghat, and the Eastern Zone corresponds with Ramtek upland, Chiroli hills, Ahiri upland, Dewalmari hills and Nawegaon hills. These zones, besides being in mountainous and hilly areas, are also the areas of very heavy to moderately heavy rainfall. No part of Maharashtra having a rainfall of less than 1000 mm rain has any forest, though this statement may not conform to the inclusion of scrubland and bushes even in a lower rainfall area under forests. The Western Zone includes Thane, Kolaba, Nashik, Dhule and Kolhapur, the northern zone Amravati and Yavatmal and the eastern zone Nagpur, Chandrapur and Bhandara districts.

The districtwise distribution of forests shows a concentration in the eastern part. Half the forests of the State lie in the five districts of Vidarbha, viz. Chandrapur, Bhandara, Amravati, Yavatmal and Nagpur. In fact, Chandrapur district alone accounts for 30 per cent of the forested area of the State. The forests of Chanda are important not only for their areal extent but also for their quality and luxuriance. The Malghat region of Amravati has some of the best moist-deciduous forests of the State. Dhule and Nashik districts, on the eastern, and Thane and Kolaba on the western slopes of the Western Ghats, are other areas which carry valuable forests. Dhule, Nashik and Thane, each has at least 6 per cent of the forest area of Maharashtra. The appendix gives the area of forests in the districts.

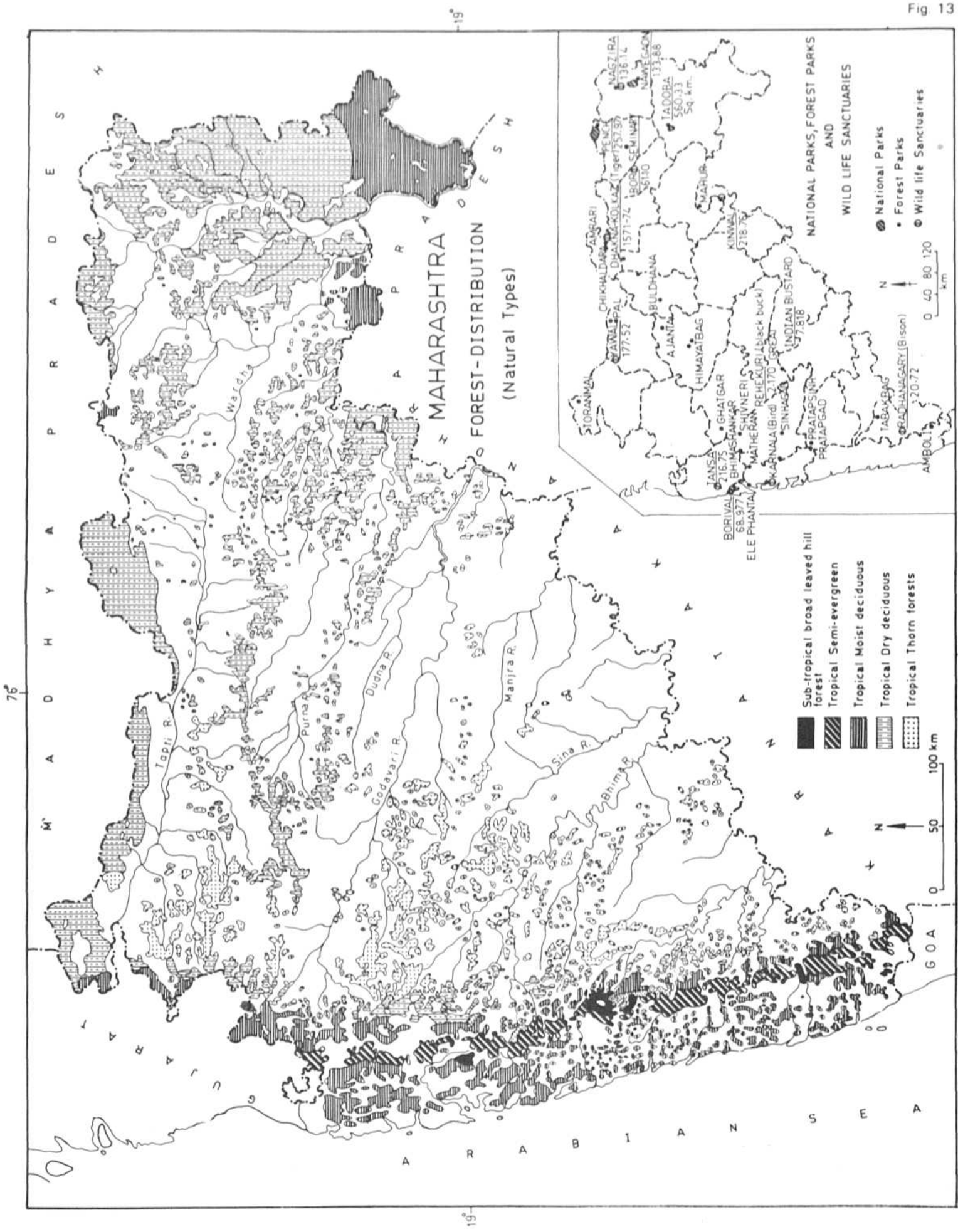
Types of Forests

Ecologically, several types of forests can be identified in Maharashtra. These accord with the classification suggested by Champion and Seth, and take into consideration the amount of rainfall and soil moisture in an area, and the morphological characteristics of the member trees. Of the sixteen groups suggested by Champion and Seth, the forests of Maharashtra find a place at least in five categories. There is, however, some ambiguity about the forests in the high rainfall areas of Western Ghats. These are classified by the forest department as 'subtropical broad leaved hill forests'. One wonders if these could not be grouped into Tropical wet evergreen forests. True, the forests at Mahabaleshwar, Matheran, Bhimashankar and Ambolighat have nothing of the luxuriance of the Tropical wet evergreen forests but their stunted growth is owing to edaphic constraint. The lateritic crust that has developed at Mahabaleshwar and Matheran is detrimental to the growth of trees. The evergreen forests of Western Ghats could, therefore, be classified as 'Western sub-tropical hill forests' while describing them in a framework of Maharashtra State, but it will not be wrong to call them Tropical evergreen forests. At places, they are described as 'sub-tropical Evergreen Forests'. How do they become subtropical is not quite understandable. Perhaps, another category like 'Tropical hill forests' could be introduced to cover forests like those at Mahabaleshwar. Here, they will be discussed as Tropical Evergreen hill forests. The other four types of forests, that are found in Maharashtra, are Tropical Moist deciduous, Tropical dry deciduous, Tropical thorn forests and the littoral and swamp forests. The five groups are discussed in the following order:—

- (1) Tropical Evergreen hill forests (also called sub-tropical Evergreen forests) and Western sub-tropical hill forests.
- (2) Tropical Moist deciduous
- (3) Tropical Thorn forest
- (4) Littoral and Tidal swamp forests.

Tropical Evergreen hill forests.—These forests are confined to the high rainfall areas of the Western Ghats in very inferior, red or lateritic soils, or on lateritic plateaus. While a heavy rainfall gives these forests an evergreen aspect, the lateritic soils and steep slopes account for their stunted growth. With the same amount of rainfall, a luxuriant evergreen forest could grow, but for the poor edaphic conditions which adversely affect the growth of trees. Another factor that militates against the growth of these forests is a long dry season. Unlike the Western Ghats in the south, where the winter monsoons bring significant amount of rains, the Northern Sahyadris are devoid of rains, practically for half the year and the soil moisture is completely depleted. Thus, February, March and April are the months when these forests experience moisture stress. Wherever there is a thick cover of laterite, only small shrubs thrive. A massive lateritic plateau, with a thickness of laterite as much as 10 m, carries no plants. This can be seen from Panchghani laterite plateau, or Mahabaleshwar plateau at Wilson point. Usually, the margins of these plateaus, where the saprolithic horizon is exposed, are characterized by forests. The margins of these high altitude (1000 to 1400 m.) plateaus carry more vegetation and are better covered with forests than their tops. There is also a belief that the blanks in these forests are due to the practice of shifting cultivation, locally called *Kumri*, or because of forest fires.

The height of trees in these forests seldom exceeds 15 m, and may locally reach 20 m. Trees with a girth of 2 m are seldom observed. The modal height of the trees, may be around 10 m, which may shrink to as short as 5 m in hard laterites, and grow to a height of 25 m. in moist areas. As one descends, on either side of these high plateaus, the evergreen forests give way to semi evergreen forests. The principal species inhabiting these forests are, *Jamun* (*Syzygium-cumini*), *Pisa* (*Actinodaphne hookeri*), *Anjani* (*Memecylon umbellatum*), *Hirda* (*Terminalia Chebula*) and *lanki* (*olea diocia*). These forests possess limited economic importance. They make a poor quality timber. The hirda fruit is used as a tanning material, and other trees are exploited for fuel. But existing in a perfect symbiotic relation with the milieu, they make an invaluable contribution to the ecology of the area, and to the preservation and protection of wild life. These forests protect the land from erosion, and save the area from extreme aridity. The losses due to evaporation are considerably minimised as the soil is not directly exposed to the sun. They may also be responsible for conserving moisture in the catchment of the rivers. Mahabaleshwar forests which are typical of this category, occupy the source region of Krishna, Koyna and Savitri. The plateau would have been wiped out long ago but for its forest cover which decelerates the pace of the headward erosion of these streams.



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Tropical Moist Deciduous forests.—Also known as Southern Tropical moist deciduous, to distinguish them from the northern tropical moist deciduous, these occur in areas with 1000 to 2500 mm of rain. These are found in Chandrapur, Bhandara, and Melghat division (the last one is in Amravati district) and the slopes of the Western Ghats that spread into Nashik, Thane, Dhule and Kolhapur districts. The tropical moist deciduous forests account for 17 per cent of the total forest area of the State. Despite a fairly high rain, these areas show a moisture stress in the dry period and the trees have to shed their leaves to conserve moisture and are deciduous in character. The growth of the trees is confined to the rainy season and a few months thereafter till the moisture lasts in the soil. The tropical moist deciduous forests occur at a relatively lower altitude and do not occur beyond 700 m. ASL. The soils in these forests are reddish brown, and the slopes under fairly high rainfall permit leaching of soils, making them poor in lime and alkalies. The pH value ranges between 6 and 7.

The most important species in these forests is *Teak* (*Tectona Grandis*). Not infrequently, natural teak is found replaced by teak stands planted by forest department. The reserved forests of Thane and Nashik districts abound in teak, so also the forests in Chanda, Bhandara and Melghat (Amravati district) regions of the State. These forests provide timber, are well protected by forest department, and form the principal source of revenue. Teak forests occupy over 11,500 sq. km. area, which is about 1/5 of the area under forest department. Other species in the moist deciduous are *ain* (*Terminalia Tomentosa*), *haldu* (*Adina Cordifolia*) Bondara (*lagerstroemia parviflora*), Kalam (*Stephegyinae parvifolia*) with a sprinkling of bamboos in certain areas that form the under-storey.

Tropical Dry Deciduous forests.—These forests occur in a relatively low rainfall area, the rainfall varying between 1000 and 1250 mm. These are relatively thin and occupy two thirds (62%) of the area under forest department. Parts of Vidarbha and Khandesh and the eastern slopes of Western Ghats enjoying rains below 1250 mm, are the areas grouped under this category. This is a blanket type and has been shown wherever the evergreen and the moist deciduous were found absent.

Dry deciduous are further divided into two subtypes, the Dry teak forests and the Dry mixed deciduous forests. In the first category, species like teak, tiwas (*ougeinia dalbergioides*), *Khair* (*Acacia Catechu*), *Shivan* (*Gmelina arborea*) and *Dhavda* (*anogeissus latifolia*) are found. The mixed deciduous on the other hand are represented by *Salai* (*Boswellia Serrata*), *dhavda* (*Anogeissus latifolia*), *moir* (*Lannea grandis*), *garari* (*Cleistanthus collinus*), *rohan* (*Soymida febrifuga*) and *ain* (*Terminalia tomentosa*). The timber derived from these forests is of inferior quality and the forests are used for fuel.

Tropical Thorn forests.—This type of forest occurs in areas having a rainfall of less than 500 mm and contains thin Jungles and clusters of Xerophytic trees. Much of the forests, in the dry tracts of Western Maharashtra, belongs to this category. The main species are *babul* (*acacia arabica*), *ber* (*Zizyphus Jujuba*) and *palas* (*Butea monosperma*). The last one, palas, is more common in Wardha and Nagpur districts. About a sixth of the land classified as forests comes under this category. Small patches of these forests are privately owned.

Littoral forests.—A large part of the coastal area, with imperceptible gradient, is submerged during high tides, but gets exposed during low tides. The daily tides and their amplitude increase during the monsoons. The intertidal areas are colonised by mangrove forests which are well adapted to the saline environment. These forests shoot up respiratory roots and overcome the drowning effect of tidal waters. The sandy and well-drained areas and particularly the sand dunes are planted with casuarina. Mangroves in the intertidal zone, and casuarina behind the sandy beaches or in the dune area, have become important vegetation. In Maharashtra, they are not as significant as in the deltaic areas of Bengal, Andhra Pradesh and Orissa. These trees are used for fuel, and are also useful in preventing coastal erosion.

Preservation, protection and plantation of forests.—The forests are owned, protected and exploited by different agencies. Out of a total forest area of 65,000 sq. km. in the State, 90 per cent is administered by forest department. About 1.5 per cent is under the control of the Forest Development

Corporation of Maharashtra, and another 7 per cent is under the supervision of the revenue department of the State. The rest of the forests lie under private ownership. The actual distribution is as follows :—

T-8.1 *Forest Areas owned by Different Agencies in Maharashtra*

Agencies administering the forests	Forest areas by legal status sq. km.			Total	% to the State's geographical area
	Reserved	Protected	Unclassed		
1. Forest department	.. 38,253	15,304	2,449	56,006	18.20
2. F.D.C.M.	.. 1,051	92	40	1,183	0.38
3. Revenue department	.. 1,459	161	3,528	5,148	1.67
4. Private forests	.. 1,741	..	..	1,741	0.57
Total	.. 42,504	15,557	6,017	64,078	20.82

The responsibility for supervision and control of majority of the forests rests with the forest department. The forest department, it must be admitted, does not have adequate machinery to supervise and protect them fully, and year after year, the forest area has been shrinking. During the last one decade or so, some degree of stability is reached, and according to statistics provided by forest department, there is a 20 per cent increase in the area under forest. The area has increased from 55,544.49 sq. km. in 1971 to the present 65000 sq. km.

Notwithstanding the efforts of forest department, degradation of forests still continues. Besides the illicit cutting, the level of encroachment has not come down, a direct result of increase in population, particularly of urban areas, and consequent rise in the demand for fuel. The 'Grow more Food Campaign', immediately after the Second World War, also claimed a sizable area of forest that was brought under cultivation. The encroachments are not only confined to the margins of the forests, but have penetrated deep inside, sometimes with the connivance of forest guards, where timber and forest products are stealthily exploited and the offenders escape during the night under the cover of darkness.

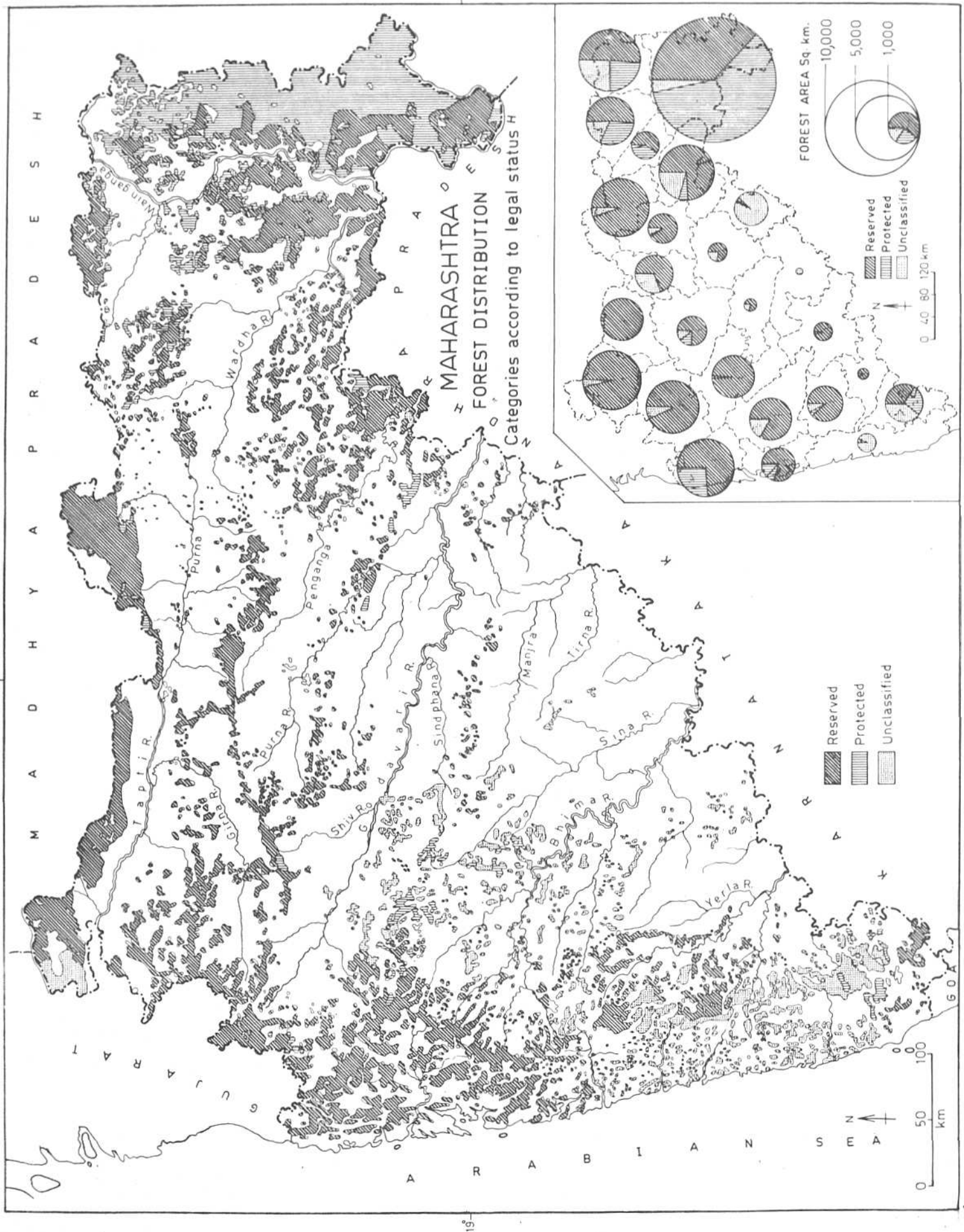
Shifting cultivation, particularly in the rainy areas of Western Ghats, has also wrought enormous damage to the forests. This is practised in sparsely wooded areas, on the slopes of the Western Ghats, usually under shrubs and bushes. More often these lands are owned by individuals, but the land even under the charge of forest department is not spared. The unproductive land on the slopes or even on flat surface with sparse vegetation is locally known as 'Varkas'. The leaves and branches of the trees are lopped, small bushes are uprooted and a cover of dry-fuel is spread over and burnt in a small piece of land. The belief is that the wood ash makes a good manure, the soil becomes rich in minerals, and because of burning the weeds and pests are destroyed. The ash-covered plot is used as a nursery for inferior crops like Nachni and Vari. Once the saplings are ready, they are thrown in the forest clearings where they give a marginal yield. The process continues year after year, only the plot for *rab*, and the area for slashing of forests and collection of leaves and twigs is changed, till the forest is regenerated for making *rab* once again. Any visitor who crosses the Western Ghats for the first time, in the month of May will be struck with nude appearance of trees, particularly 'Ain', of which the leaves and twigs are completely lopped for making *rab*. Shifting cultivation in Western Ghats is called 'Kumri'.

Grazing has also caused havoc. It loosens the soil and induces erosion. Unlike the cutting of mature grass, an operation in which the roots are not disturbed, grazing disturbs the roots of the plants besides shaking the soil. The cattle are also likely to trample and cause damage to the plants. In fact, the right of grazing granted to many villages could be substituted with right to grass cutting.

Development of river valley projects has also claimed some forest land, but the gains from the river valley projects justifies the sacrifice of a few hectares of forest land. In Maharashtra, the loss of forests is marginal. In Western Ghat region which abounds in river valley projects, over 2000 hectares of forest land have gone to river valley projects though a much larger acreage (13,000 hectares) is taken from the forest department for the rehabilitation of the people affected by river valley projects.

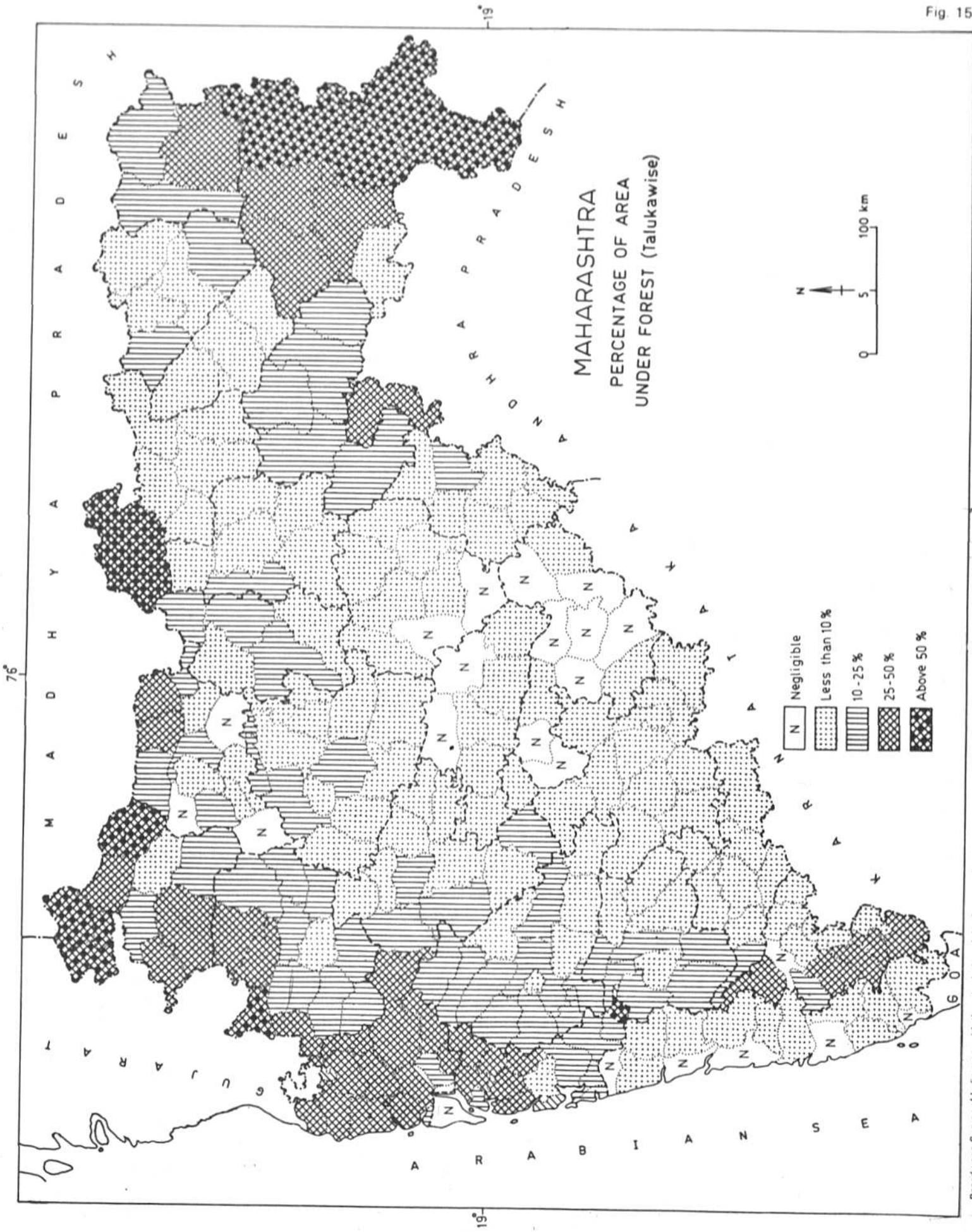
Forest produce.—The economic gains flowing from the forests are enormous, but there are some that are more spectacular. Some are short-term and some of the benefits can be realized only after a long period. The forest produce offer immediate gains and are the principal source of timber, fuel, forage, medicines and raw materials for many industries. The State produces 320,000 cubic metres of timber, and 1.46 million cu.m. of fuel wood annually. Timber alone accounts for 65 per cent of the total

Fig. 14



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 15



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

revenue accruing from the forests. Other important products include bamboo, bidi leaves and grasses. The revenue from each of these produce is as follows:—

T-8.2 Maharashtra—Forest Produce, their Value and Volume

Forest produce		Production (Quantity in lac cu.m. value (lacs of rupees)	Revenue in lacs of rupees	% of total revenue of the State
Timber	..	3.2 lac cu.m.	2,835	64.9
Firewood	..	14.66 lac cu.m.	532	12.18
Bidi leaves	..	388.89 lac rupees	648	14.84
Bamboo	..	108.79 ..	103	2.36
Grass and grazing	..	36.77 ..	38	0.87
Sandalwood	..	1.14 ..	..	..
Gum	..	28.66 ..	..	..
Other minor products	..	50.68 ..	78	1.78

Besides being used for timber, fuel, forage and medicine, forests support a number of industries and there is virtually no substitute raw material for some of these industries. Some of the industries supported by forests are:—

1. Pulp and paper
2. Plywood
3. Kath
4. Tanin
5. Palmarosa oil
6. Matches
7. Textile machine accessories

Pulp and paper industry rests almost entirely on the forest resources. The most commonly used source of cellulose is 'bamboo' and 'salai wood'. While bamboo is used for all varieties of pulp and paper, Salai is generally used for newsprint. The Ballarpur Paper Mills at Ballarpur in Chanda district, Sirpur Paper Mills in Andhra Pradesh, and the Central pulp mills in Gujarat get fully or partly their raw materials from forests of Maharashtra. Chandrapur, in fact, has become an important centre of forest based industries. Kath is derived from 'Acacia catechu', and organized kath factories operate at Dahanu and Chandrapur. The use of Hirda (*Terminalia Chebula*) as a tanning material has been traditional and the exploitation of hirda fruit for extracting tannin continues. A factory for extraction of tannin from hirda is run at Kolhapur. The light wood of semal (*Salmalia malbarica*) is used for the manufacture of matches, and bobbins are made out of the wood of *haldu* (*adina cordifolia*) and *Kalam*. The distillation of oil from rosha grass is an important industry.

Future of forests.—With an increasing realization of the long term benefits on the part of the Government and the people, the attitude of indifference and commercial gains has given place to a feeling of affinity towards nature and moved the society into a conscious effort towards preserving, protecting and growing forests. The role of forests in preserving atmospheric oxygen, as a preserver of wild life and the rarest of flora and fauna, and as an effective device against soil erosion has been well realized. In Maharashtra, new varieties of trees are being experimented with in certain areas. Medicinal plants like dachini, fruit trees, cashew, and beverages like coffee, are being tried out in certain areas by the forest department of the State. The preservation of forests in the river catchments, associated with projects is given due importance in all planning efforts. With so much of outcry from the people against every possible damage to the forests, one is inclined to believe that the worst for the forests is over.

Wild life in Maharashtra.—A word is being added here about the wild life in Maharashtra. Among the predators, tiger and panther are known to have existed in abundance in Maharashtra, but their number has since declined. The tiger is virtually unknown in the Western Ghats region and is confined to Melghat forests in Amravati district, and the forests of Chanda, Bhandara and Nagpur districts. According to 1979 census the total number of tigers in the State is 174, of which sixtyfive are in the project area of Melghat forests. The rest are in the forests of Chanda and Bhandara. The panthers are found in the forests, in Eastern as well as Western Maharashtra.

Among the herbivores, the Bison is by far the most important animal and is found in herds in the forests of Radhanagari near Kolhapur. The Eastern Maharashtra region has most of the wild life, which are found in other parts of the State. In Western Maharashtra, wild life occurs in small islands, aligned with Sahyadri and Satpuda ranges.

Black-buck is restricted to sparsely forested areas and grassy lands in Marathwada districts. The State also has some wild buffaloes which migrated from Madhya Pradesh to the forests of Bhamragad in Chandrapur district. In Maharashtra, black buck, wild buffalo, mouse deer and Barasingha have become rare species.

To preserve wild life in the State, a number of national parks, wild life sanctuaries and forest parks are maintained by forest department. The locations of national parks, wild life sanctuaries and forest parks are given below:—

T-8.3 National Parks, Wild Life Sanctuaries and Forest Parks in Maharashtra

	District	Area in sq. km.
National Parks		
1. Tadoba	.. Chandrapur	116.55 sq.km. + 443.78 sq.km. (proposed to be added)
2. Borivali	.. Thane and Greater Bombay	68.977
3. Pench	.. Nagpur	257.26
4. Nawegaon	.. Bhandara	133.38
Wild life sanctuaries		
1. Karnala (Bird)	.. Kolaba	4.48
2. Radhanagari (Bison)	.. Kolhapur	20.72
3. Tansa	.. Thane	216.75
4. Bor	.. Wardha	61.10
5. Dhakana-Kolkaz	.. Amravati	381.58
6. Yawal	.. Jalgaon	177.52
7. Nagzira	.. Bhandara	152.81
8. Kinwat	.. Nanded & Yavatmal	218.76
9. Deolgaon-Rehakuri	.. Ahmadnagar	2.17
10. Great Indian Bustard (Proposed)	..	7,818.47
Forest Parks		
1. Ajanta Caves Park	.. Aurangabad	1.6
2. Informal Garden and sacred Grove at Jayakwadi (Paithan)	.. Aurangabad	0.22
3. Himayatbag	.. Aurangabad	0.18
4. Pandit Nehru Park	.. Nanded	0.04
5. Seminary Hill	.. Nagpur	0.71
6. Pal	.. Jalgaon	1.03
7. Toranmal	.. Dhule	0.29
8. Baneshwar	.. Pune	0.08
9. Sinhgad	.. Pune	0.11
10. Panchgaon Parvati	.. Pune	2.45
11. Bhamburda	.. Pune	0.78
12. Mula Mutha	.. Pune	1.82
13. Chikhaladara	.. Amravati	0.05
14. Ranibag	.. Buldana	0.50
15. Tabakbag	.. Kolhapur	0.03
16. Pratap Singh	.. Satara	0.10
17. Pratapgad	.. Satara	0.04
18. Amboli	.. Ratnagiri	0.05
19. Elephanta	.. Raigad	1.32
20. Matheran	.. Raigad	0.04
21. Vajreshwari	.. Thane	1.08
22. Narnala	.. Thane	0.15
23. Shivneri	.. Pune	0.40

CHAPTER IX

LANDUSE AND AGRICULTURE

Maharashtra, the richest State in the country in terms of gross domestic product, and with the highest per capita income, is not so privileged when it comes to agriculture. The State suffers from the adverse effects of its physical conditions, with the result that only 60 per cent of its geographical area is under cultivation. This, however, sounds quite optimistic when compared with 47 per cent for the whole country. The State accounts for 13 per cent of the cultivated, and 4.5% of the irrigated area of the country, and is the largest producer of Jowar and the second largest producer of sugarcane in India.

The mountainous terrain associated with the Sahyadris and the Satpudas, the dissected slopes at the foot of these mountains, the extensive plateau areas without a thick soil cover and the lateritic soils of Konkan—all have conspired to restrict the area under cultivation. Even the area that is cultivated suffers from infertile soil and the deficiency of moisture, since a large part of Maharashtra receives less than 800 mm of rains. Only 11 to 12 per cent of land is under irrigation which some 15 years ago was about half of what it is today. The farming, therefore, is essentially rainfed and gives marginal returns. In fact, in the soils of mountains and the plateau tops, it is just a subsistence farming.

Land Utilization.—About 60 per cent of the land is under cultivation. The remaining area is either covered with forest, left fallow or classed as a culturable waste. Besides, a small percentage of area is not available for cultivation at all.

T-9.1 *Land Utilization in Maharashtra (1975-76)*

	Area '000 hectares	%
Total geographical area of the state	307,582	
1. Net sown area	182,616	59.3
2. Forests	53,337	17.3
3. Land not available for cultivation	26,863	8.7
(a) land put to non-agricultural uses	9,482	
(b) barren and uncultivated land	17,381	
4. Other uncultivated land excluding fallow land	28,285	9.2
(a) Permanent pastures	16,151	
(b) Miscellaneous tree crops and groves	1,933	
(c) Cultivable waste	10,201	
5. Fallow lands	16,482	5.3
Total	307,583	99.8

These figures refer to the year 1976. During the last six years some change has been effected. While the area under cultivation has remained the same, the area under forest has increased to over 20 per cent, and today the state has over 65,000 sq. km. of land under forest which is a sizable increase of 25 per cent.

Land under cultivation.—The single most important factor brought to bear on the proportion of land under cultivation is relief. Climate does not appear a significant factor, though it becomes vital when it comes to agricultural productivity and yield.

The hilly, dissected and forested area on both sides of the Western Ghats, in Satpuda ranges and the eastern part of the State have less than half the area under cultivation. The five Konkan districts, Greater Bombay, Thane, Raigad, Ratnagiri and Sindhudurg, have each less than 30 per cent of their area under cultivation. The urban sprawl in case of Bombay and Thane, together with the hills of Western Ghats, the very dissected and hilly terrain of Raigad, with the outliers of the Western Ghats projecting close to the Arabian Sea coast, and a thick cover of laterite in Ratnagiri district, have restricted the area under cultivation. An almost similar situation exists on the eastern slopes of the Western Ghats, the Maval region. In Nashik, Pune, Satara and Kolhapur districts the cultivated areas range between 50 and 60 per cent. The extension of river valleys plains right upto the source of the rivers has ameliorated the situation and made larger area cultivable. The eastern periphery of the State, besides being mountainous, is forested and the forests have not been destroyed as much as in other parts the State giving lower acreage under cultivation. Chandrapur and Bhandara have 27 and 42 per cent area under cultivation respectively, and the percentage rises in Nagpur and Amravati, each with 58 per cent of their area given to cultivation despite the hills.

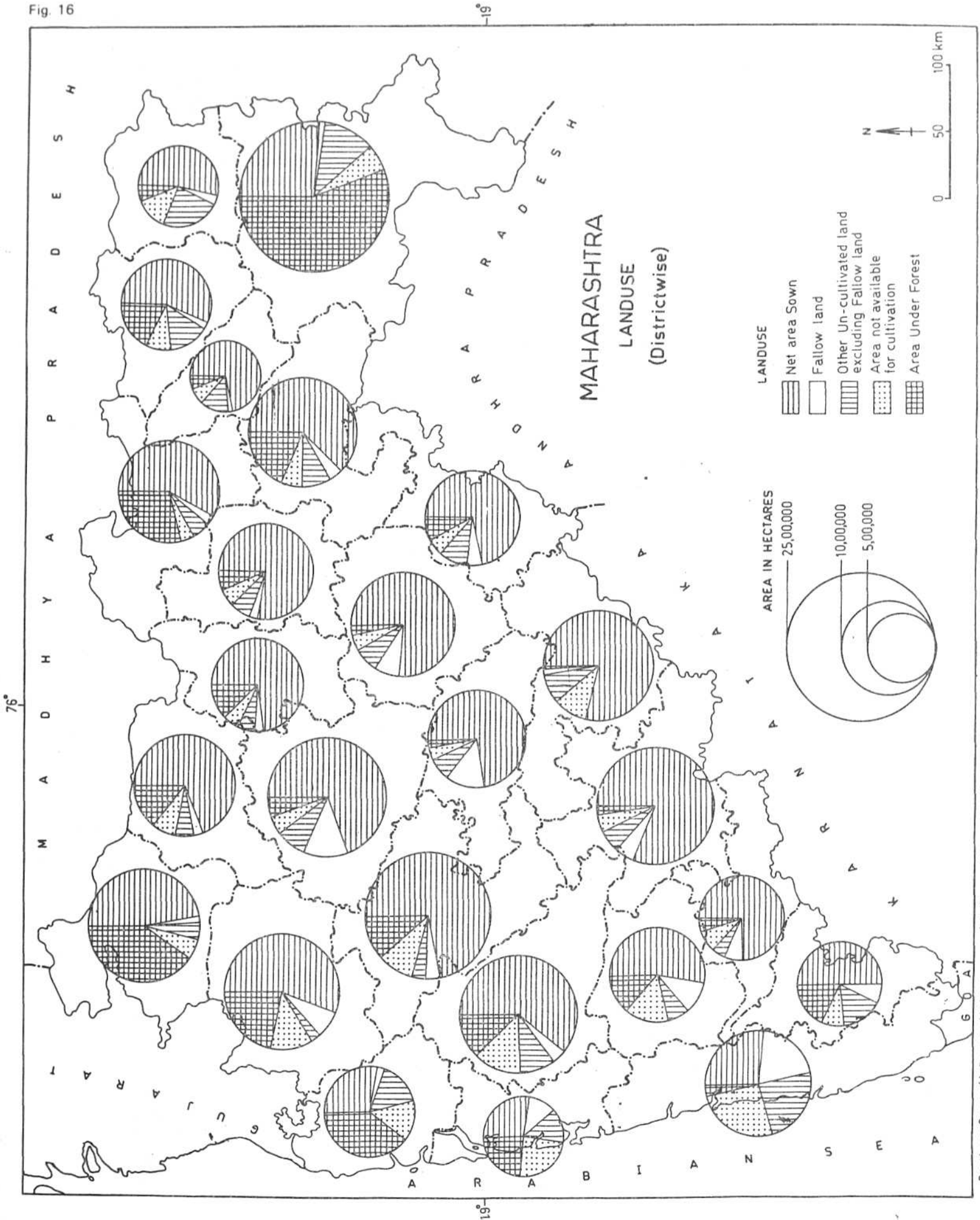
The rest of the State has 3/4 of the land under cultivation. Paradoxically, the least productive and most famine-prone areas have the distinction of showing a high percentage under cultivation. Osmanabad (83%), Parbhani (80%), Aurangabad (76%), Beed (70%), Ahmadnagar (74%)—these districts lying in the dry core of Maharashtra, depending solely on rainfed agriculture, without any support either from a favourable rainfall distribution or from a network of irrigation have, it seems, attempted to eke out a living by turning every inch of available soil and growing a crop that could thrive without irrigation. This adverse climatic and developmental situation has been supplemented by a land that is relatively flat and drained by the largest river of the State, Godavari. The areas with higher rainfall and greater irrigation potential have far less cultivated land, firstly because of topography but no less because of a forest cover, which thrives in high rainfall area and needs to be preserved.

The valleys of Godavari, Tapi, Krishna and Bhima and their tributaries have traditionally supported agriculture. The fertility and agricultural productivity are not alike everywhere. With the sole exception of Panchganga and Krishna valley, the district of Sangli where a high percentage of cultivated area is coupled with high productivity, elsewhere a high percentage of cultivated land is characteristic of the terrain with poor and subsistence farming.

Area not available for cultivation.—There are areas in the State which cannot be brought under cultivation. Such areas are either already occupied by non-agricultural uses, like urban and industrial landscape, transport network, quarries, parks and gardens, water bodies and recreational grounds or cannot be tilled for reasons of non-arability. Many such areas suffer from duricrusts, carrying crusts of iron or lime, or, are too steeply inclined to allow any cultivation. Though in the State as a whole, such lands account for only 8 to 9 per cent of the total land, in specific regions they become too obvious to be ignored. The two coastal districts of Ratnagiri and Raigad lose 1/4 of their total area as unavailable for cultivation. In case of Ratnagiri, it is the lateritic cover and the steep valley side slopes, but in Raigad it is the inter-tidal area, which because of a flat coastal profile is salt-studded and appears beyond redemption, unless a coastal dyke is built and the area is isolated from the tidal ingress. This, of course, is a feasible, but expensive measure. The saline efflorescences also appear in coastal areas but get submerged under the tidal waters during monsoons. All the hilly areas like Pune, Satara, Thane and Nashik have more than 1/10 of their areas in this category. This also explains a lower percentage of cultivated area in these districts.

The Uncultivated land.—There is some cultivable land still untilled, over and above the acreage under cultivation, but this exists either as permanent pastures, carries some tree crops or is represented by cultivable waste. Of the three sub-categories that constitute the uncultivated land, the parcel under three crops is rather negligible, though this could be treated as sown as much as the land carrying crops. The land under permanent pastures are the ones marked grazing ground owned in common by the village community or recorded as 'Gairan' (literally meaning the land for the cow) which is also used for grazing cattle during the monsoons. The pasture lands usually carry a very thin residual soil. The thin soil supports grass during the monsoons and becomes a desolate rock waste during the dry summer. The 'warkas' land in hilly 'Maval' or down the Western Ghats in Konkan, is also included in this category. Plateaus and hilly dissected areas with higher rainfall are the principal sites of such pastures. The eastern districts of the State, Nagpur and Bhandara, and Pune and Satara carry such pastures in abundance.

Fig. 16



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

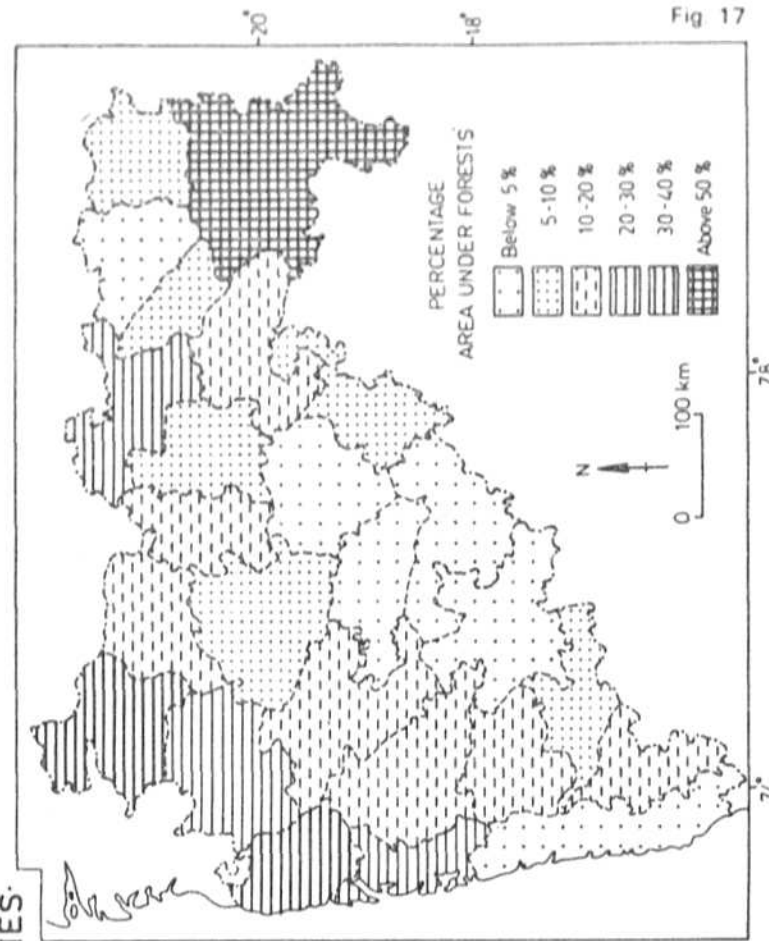
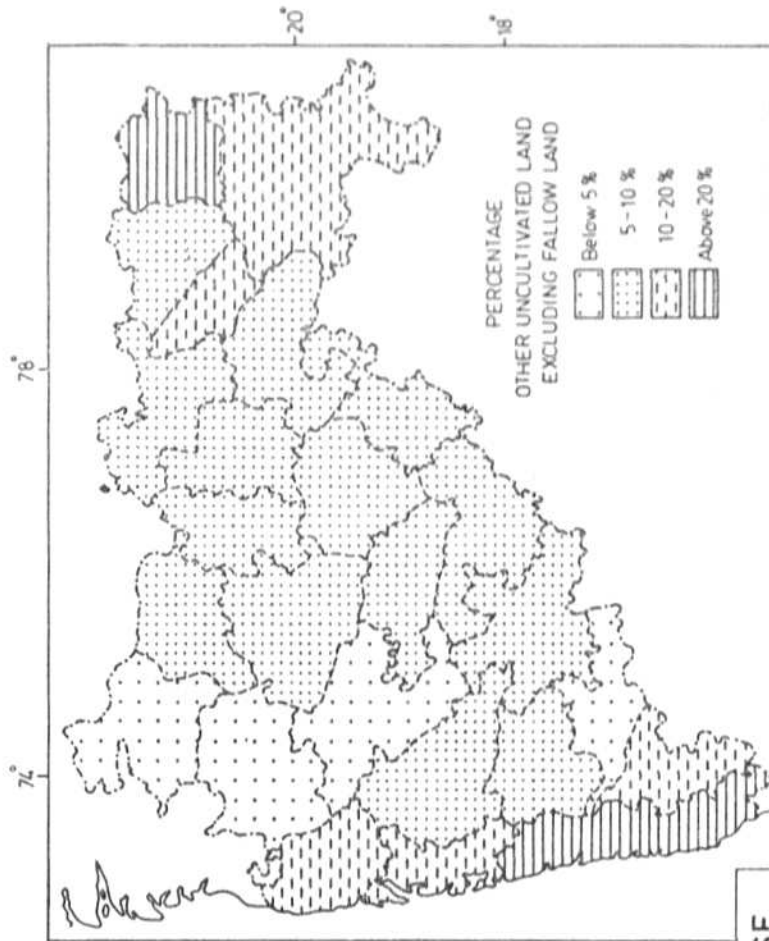
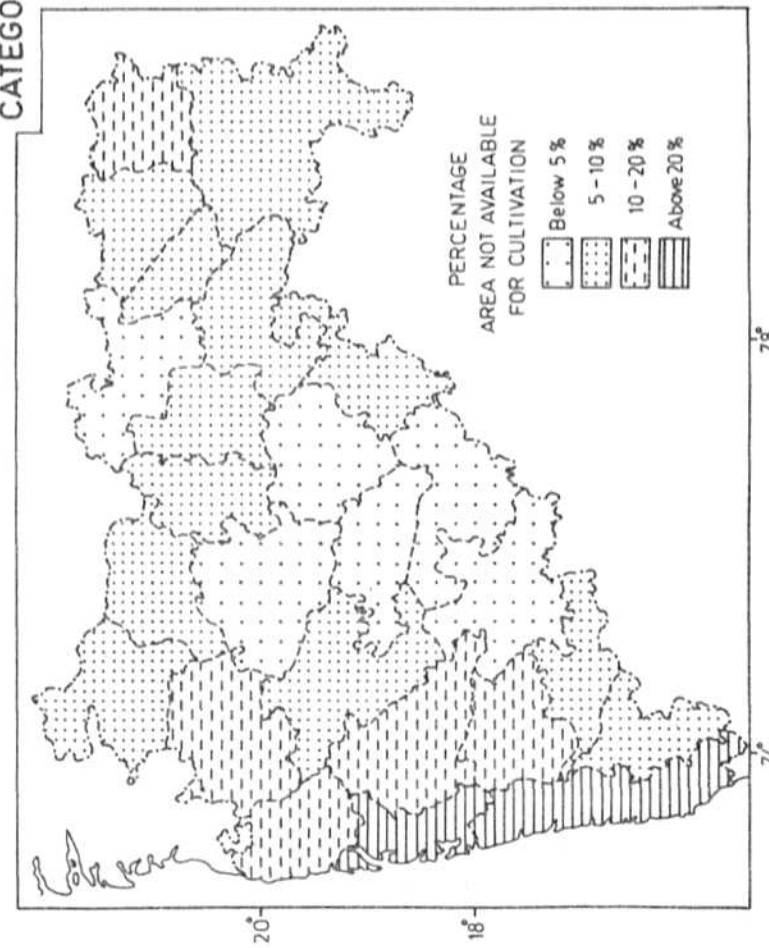
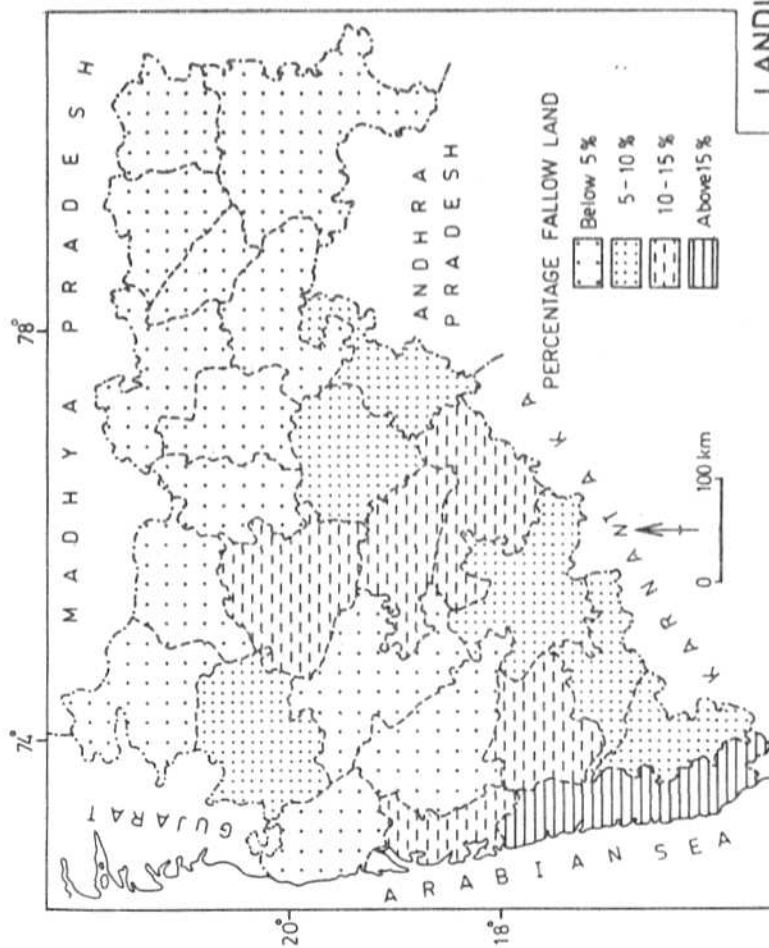


Fig 17



LAND USE CATEGORIES

Culturable waste.—There is no knowing the fact as to what is included in the culturable waste. The term suggests that these lands can be brought under cultivation but have turned into wasteland because of neglect of people, bad planning or lack of enterprise. The largest area recorded is in Ratnagiri district, where the area not available for cultivation is equally high. There is very little difference between 'barren and uncultivable land', 'permanent pastures' and culturable waste in respect of the quality of land. The legal status of the land as well as the discretion of the recorder makes the difference. In a country like India with a tremendous population pressure, it is unbelievable that over 3 per cent of the total area is culturable, but has not attracted the attention of the people. The author has seen the thinly forested areas being cleared and brought under plough. What appears nearer truth is that these areas are culturable topographically, but are lying waste because of excessive salinity, poverty of an individual farmer who owns a parcel of such land, or family and other legal disputes. The permanent pastures and the culturable wastes together occupy 8.5 per cent land of Maharashtra. As suggested earlier all such land should be put under grass, and not given to grazing that accelerates soil erosion.

Fallow lands.—The fallow land should be a part of the land under cultivation. In fact, net sown area and fallow land together should add up to the land under cultivation. To distinguish the land left fallow as a phase of crop-rotation system, the term current fallow is used. Other fallows include the land left idle for more than 2 years, or temporarily given up because of depletion of its fertility. Sometimes, a particular field is cultivated once in every three years and such land can be included in other fallows. The largest acreage of land under 'fallow' is in Ratnagiri district. In the dry areas of the State, the fallow land shows yearly variation depending upon the amount and distribution of rains. In years of above average rainfall, the fallow lands are tilled and a crop is taken out.

Land utilization and land productivity.—There is hardly any relationship between land utilization and productivity of the land. This applies to specific areas as much as to the entire State. Productivity depends upon the yield which is not only a function of optimum edaphic and climatic conditions, but is equally dependent on other man made inputs. In case of Maharashtra, the variations rest solely on the severity of physical constraints on the one hand and the availability of irrigation on the other. With most of the State enjoying only 15 weeks of rain varying widely in amount, the areas receiving less than 1000 mm rain have a precarious existence. Where the water through irrigation is assured, the enterprising farmers go all out, not only for higher inputs by way of fertilizers and improved seeds but also for modern methods of agriculture. Productivity is thus higher in irrigated areas and in areas with over 1500 mm of rain. The regions with the highest percentage of land under cultivation are least productive.

The areas with assured irrigation have also changed their crop pattern, substituting cash crops for the time tested cereals and cash crops like Jowar, Bajra, Safflower and cotton. The new entrants are sugarcane, grapes, bananas and vegetables, all making agriculture more lucrative in irrigated tracts and giving rise to a class of *nouveau riche*, locally known as 'bagaitdars', the plantation owners.

Agriculture

With about 20 million hectares of land under cultivation, that constitutes roughly 60 per cent of the area of the State, Maharashtra can as justifiably claim to be as much an agricultural region of India as an industrial one. There is, however, one basic difference; the State is far too poor in its performance in agriculture in contrast to its spectacular industrial growth. With only 9.2 per cent of the country's population and 13 per cent of its cultivated land, the State appears to have an above average man-land ratio, but its contribution to the agricultural production of the country is not comparable to area, giving an indication of a relatively poor yield and inefficient agriculture.

The State is an important producer of two principal cash crops, cotton and sugarcane. Cotton the traditional cash crop of Maharashtra and grown predominantly in Khandesh and Vidarbha claims the third largest share in the country, after Gujarat and Punjab. Maharashtra is also the second largest producer of sugarcane next only to U.P. The State is inching forward in agricultural productivity with increase in irrigated area and introduction of improved seeds.

Land, soil water and organization of agriculture.—Despite improvements, agriculture in the State carries the imprint of the farmers traditional adaptation to the physiographic conditions in the area. The agricultural practices and the crop pattern represent a long evolved system which has emerged after centuries of trial and error. The three most important factors that have influenced agriculture are the nature and thickness of soil, quality of land and the amount and periodicity of rainfall.

The too steep and too rugged areas of mountains have been avoided. An average of over 1200 mm of rain has been able to support paddy, both in the extreme western and eastern parts of the State. In areas with rainfall between 800 and 1200 mm, cotton and groundnut are the principal crops. In areas with less than 800 mm rain, Jowar and Bajra reign supreme.

In Konkan with about 2000 mm. of rain, paddy is grown all over, though its scope is limited because of an overall low percentage of area under cultivation, either because of lateritic cover, as in Ratnagiri district, or because of hilly terrain as in case of Thana and Raigad districts. The vegetable gardens in areas close to Bombay reflects the impact of Bombay. The bare slopes of the Sahyadris and the highly irregular terrain of Maval, suffer not only from excessive leaching but even linear erosion and surface wash, making the land in the process unsuitable for cultivation. With very thin soil on the slopes some inferior millets like 'nachni' is grown, which matures in less than 10 weeks. The valleys in Maval, carrying thick alluvial deposits, largely brought by soil creep from the hill sides, are the favourite sites of paddy. Paddy grows even in very shallow soils in the area because of heavy rainfall. The rain shadow area, about 40 km east of the Western Ghats, ushers in a domain of millets, which spreads over the entire Maharashtra, with the exception of Bhandara region. Thus leaving aside the rainy Konkan and Maval and a fairly high rainfall area of Bhandara, the entire State grows Jowar, with either Bajra or cotton as second crop depending on the conditions of rainfall and soil. Bajra is not a preferred crop but is a necessity in the thin soils of Western Maharashtra with relatively low rainfall. Being hardy, it can stand the dry spell and moisture stress which develops in thin soils even after a few days of dry spell.

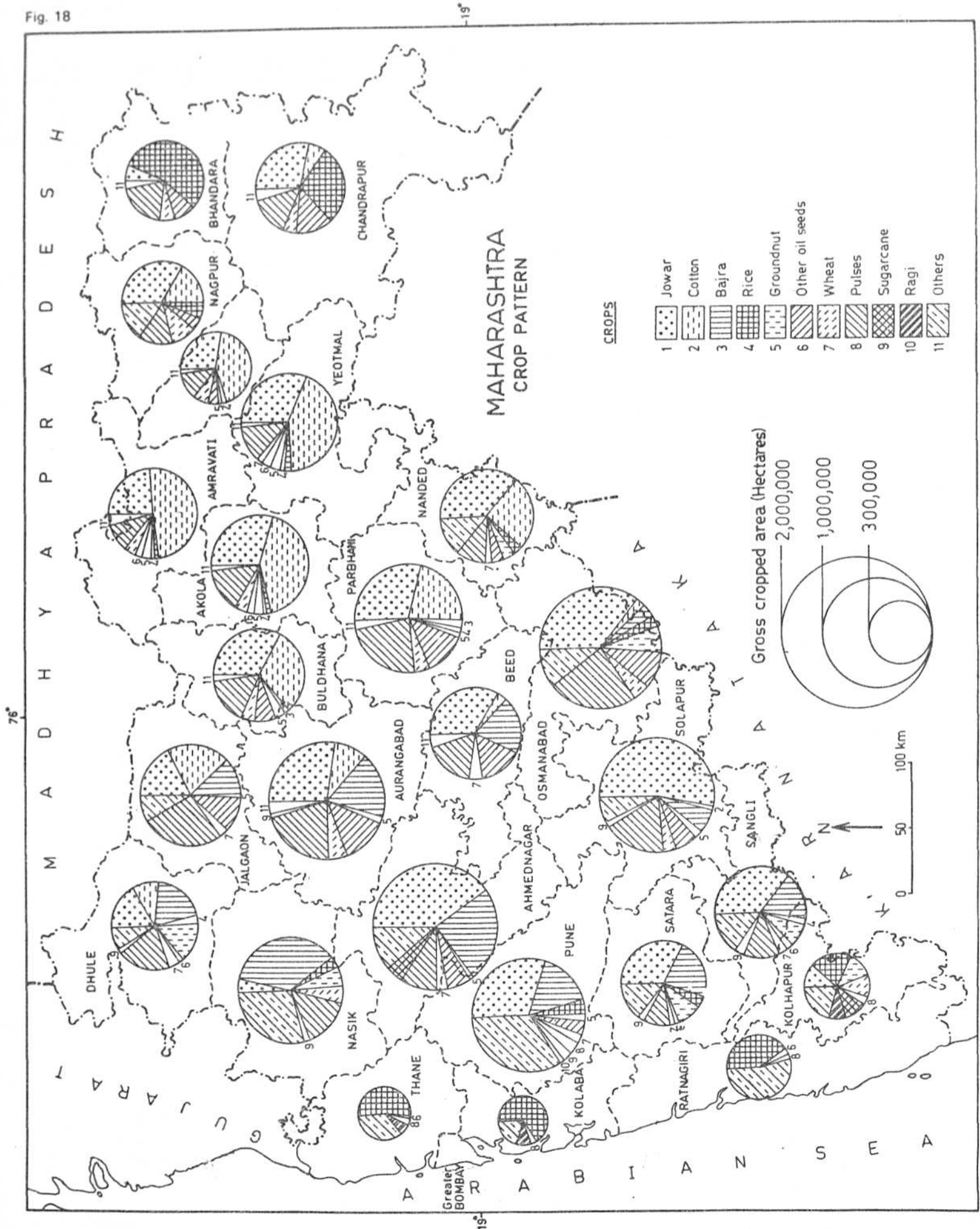
In the plains of Tapi, cotton becomes an important second crop because of thick black cotton soil and a relatively moderate rain. Cotton dominates also the Vidarbha region, where Jowar is displaced to a second place. One may summarise by saying that heavy rainfall areas have supported rice, with inferior millets on the slopes. A thick soil with 600 to 800 mm of rain is invariably under Jowar, and wherever the soil becomes thin bajra makes its appearance. In more than half the area of Maharashtra, Jowar is the first crop. In areas with thick black-cotton soil and a rainfall of over 800 mm, cotton is the principal crop. Wherever irrigation is available, the land-use is radically changed and crops with maximum return and unusually large requirement of water make their appearance. Sugarcane is the most preferred crop, though it occupies less than 1.5 per cent of the total cultivated area. Grapes and bananas have, of late, become important with an adequate domestic market.

Crop pattern.—On a rough estimate, about three fourths of the cultivated area is under food-crops and the remaining under non-food crops. Thus, despite the introduction of a variety of cash crops, providing food to the people remains the main function of agriculture in the State.

T-9.2 Acreage of Different Crops in Maharashtra

Crop	Area (hundred hectares)	% of the cultivated area in the State
1. Food crops	145,340	73.9
(a) Jowar	60,642	30.83
(b) Bajra	18,077	9.19
(c) Rice	14,157	7.19
(d) Wheat	11,691	5.94
(e) Ragi	2,103	1.06
Total of cereals	109,306	55.58
Total pulses	29,139	14.81
Total foodgrains	138,445	70.4
Sugarcane	2,678	1.36
Fruits & vegetables	2,356	1.19
Condiments & spices	1,839	0.93
Miscellaneous food crops	22	0.011
2. Non-food crops		
(a) Oil seeds	19,137	9.7
(b) Fibre crops	23,996	12.20
(c) Drugs & Narcotics	134	0.06
(d) Fodder crops	7,992	4.06
(e) Miscellaneous non-food crops	40	0.02
Total Non-food crops	51,299	26.08

Fig. 18



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

In terms of acreage, jowar, cotton, bajra, paddy, wheat, groundnut and sugarcane are the principal crops of the State. Maharashtra is the land of Jowar, which is the staple food of the farmers. The State produces over 9 million tons of foodgrains of which 3.5 million tons is the share of Jowar, which constitutes 44 per cent of the total production of foodgrains in the State. Jowar and Bajra together add up to more than half of the total area, and production of all the foodgrains put together, showing the pre-eminence of these crops in the agricultural economy of Maharashtra.

Trend of Agricultural production.—During the last twenty-five years there has been an increase in both, the area as well as agricultural production. The expansion in area has not been at the expense of forests which have also recorded an increase in their acreage. Some degree of reclamation from the culturable waste has added to the total land under cultivation. Below are reproduced for comparison the area and production of principal crops for 1951-52 and 1975-76 :—

T-9.3 Trends of Area and Production of Certain Crops in Maharashtra

Crops	1951-52		1975-76	
	Area (00 hectares)	Production (00 tonnes)	Area (00 hectares)	Production (00 tonnes)
Jowar	53,173	23,139	60,642	34,662
Bajra	17,818	3,947	18,077	5,600
Rice	11,205	9,213	14,157	22,858
Wheat	6,764	2,485	11,691	11,991
All cereals	94,061	41,167	1,09,306	78,689
All pulses	24,761	9,457	29,139	11,675
All foodgrains	1,18,822	50,625	1,58,445	90,362
Cotton	22,813	2,035	23,069	1,326
Tobacco	180	106	111	49
Groundnut	9,636	5,440	8,544	6,925
Sugarcane	911	6,267	2,678	22,186
		(Gur)		

There has been an overall increase in the net sown area as well as the gross cropped area. The increase in the gross cropped area is more than the simple increase in the area under cultivation. Obviously, with the expansion of irrigation more area has got the benefit of double or triple cropping. Cropwise, almost all crops have registered an increase in their acreage as well as production. A two-fold increase in the production of rice and about fivefold in wheat appear quite impressive.

The acreage under cotton has not changed much and virtually remained stable; tobacco shows a decline and groundnut shows an indifferent trend. The most phenomenal growth has taken place in case of sugarcane, which has grown three-fold in the last 15 years and does not show any signs of relent.

The changes are not always suggestive of a trend, they are often born out of the yearly fluctuations, resulting from the variability of rainfall, from a good year of optimal rainfall both in amount and dispersion to a precarious or a drought year when the yields suddenly drop to half of even one third. occasionally, there is a total failure of crops. Jowar suffers most from such vicissitude of climate. A very interesting feature of a decline in the production of Jowar is an associated increase in the production of bajra. The adaptation of Bajra to an adverse situation of inadequate rains is quick and spontaneous, and the farmer turns to bajra in the absence of good rains without which Jowar does not grow. In famine years when the rains are scanty, all food crops suffer.

The fluctuations in the production of crops like cotton, tobacco and groundnut reflect, to a great extent, the response to market mechanism and the price situation. The acreage under these crops expands or contracts in response to the demand and the prevailing market prices. The increase in irrigation has brought about an increase in the area and production of cash crops like sugarcane.

Yields.—The overall increase in the production of foodgrains and other crops has resulted from an intensive cultivation on the one hand and a marginal expansion of the cultivated land on the other. A significant increase has been nonetheless found in case of rice and wheat.

T-9.4 Yields of some Principal Crops (Kg. per hectare)

		Rice	Jowar	Bajra	Wheat	Groundnut
Maharashtra	..	1,600	572	310	1,020	810
India	..	1,300	717	486	1,574	846

With the exception of rice and sugarcane, the yields of most other crops are lower than the national average. There has been, no doubt, a significant increase in the production of rice, wheat, pulses, oil-seeds and sugarcane. The most spectacular increase has taken place in the production of food grains, which is more than doubled from 5.06 million tonnes in 1952 to 10.47 million tonnes in 1980, and means an assured supply of foodgrains to the State.

Agriculture and Agricultural situation.—Traditionally, agriculture in Maharashtra has been rainfed and the landuse and the crop pattern have been adjusted by the farmers to the soil, topography and rainfall conditions. The crops, according to their growing seasons, are grouped into Kharif and Rabi crops. This classification, adopted by the Moghuls, is still the most popular. The Kharif crops are sown at the advent of monsoons and harvested before the advent of winter. The rabi crops, on the other hand, are sown in October/November and harvested in February/March. Paddy is the principal kharif crop; bajra, jowar, groundnut and pulses are other kharif crops, of which jowar is grown more as a rabi than a kharif crop.

The Konkan and Maval receive heavy rainfall during the summer monsoon, and have hardly any winter rains. The inferior soil of the area is another constraint, with the result that these areas grow only kharif crops, paddy in the flat low-lying areas and inferior millets on the slopes. The eastern parts of the 'Desh' districts, like Ahmadnagar, North and South Satara, Pune and Nashik, receive rains largely from the South-West monsoon, and also enjoy some rains during the winter. Thus, they have better distribution of a relatively meagre rainfall and grow rabi crops, like jowar, safflower and linseed.

Further east, the winter rains are heavier as also the summer rains, and cotton enters in a big way. Its place is taken by paddy only in the areas with over 1200 mm in eastern Maharashtra. The rainfed or more appropriately the unirrigated land under cultivation in Maharashtra is known as 'Jirayat', a depressing expression in contrast to 'bagait', the irrigated land. Much of the agriculture in Maharashtra comes under 'jirayat' and the bounty of crops always depends on the timely onset of monsoons and their balanced periodic distribution. Delay in the onset of monsoons or their total failure wreaks havoc on the farmers and creates famine conditions. Thus, part of Maharashtra always suffers from chronic scarcity. Dearth of resources, prevents farmers from digging wells for irrigation. The wells, surprisingly never run dry, fed as they are with a recharge from the ground sources connected with heavy rainfall areas in the Western Ghats. A severe drought not only brings bankruptcy to the farmer but demoralizes him in a specific year, and the aftermath continues over several years. Gripped by the fear of drought or a delayed monsoon, the farmer in the drought prone areas of Maharashtra is a pathetic picture. He is dissipated and never recovers from the recurring shock of drought, famine and indebtedness. Such is the condition of Jirayat cultivator of the Deccan.

The more enterprising among them develop what are locally known as 'Malas'. A 'mala' is a patch of irrigated land with the well as the nucleus. This small acreage, limited by the capacity of the well to provide irrigation, is largely immune from the vicissitude of monsoons and offers an assured yield. The farmer looks at his 'mala' with great fondness, and his hopes, and aspirations are centred around it. The institution of 'mala' is understandably more deep-rooted in the dry districts of 'Desh'. As such, Nashik, Ahmadnagar, Aurangabad, Pune and Solapur districts have the largest number of irrigation wells, as is expected in these drought prone areas. The 'mala' also offers the site for garden and other cash crops. The landuse in these 'malas' is intensive and the acreage of high-water-requirement crops like sugarcane is limited by the water yield of the well. Sugarcane was initially confined to the 'malas', but later on spread to canal and lift irrigation areas. Today the large sugarcane tracts have assumed much greater significance than the traditional 'malas', though the latter are still the lifeline of the middle class farmers.

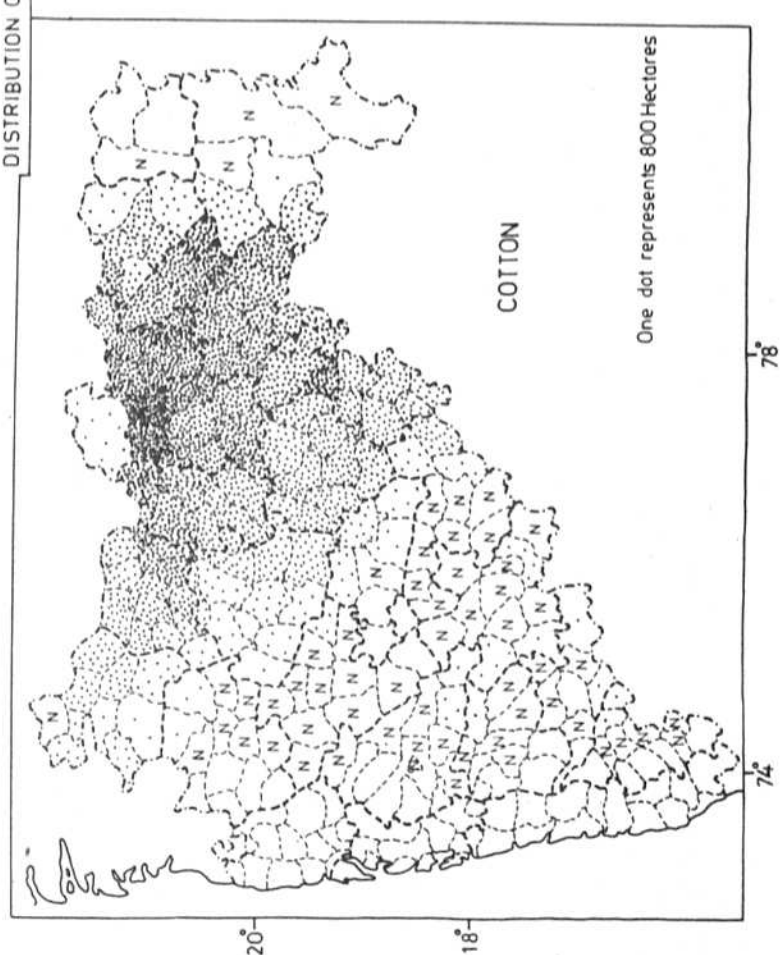
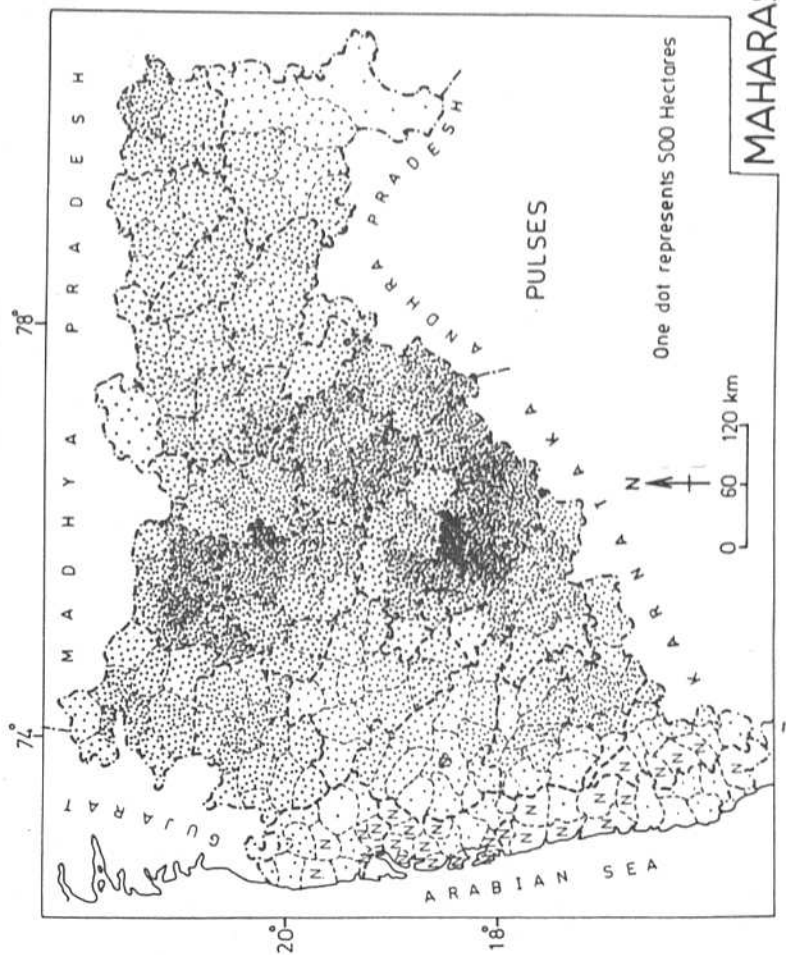
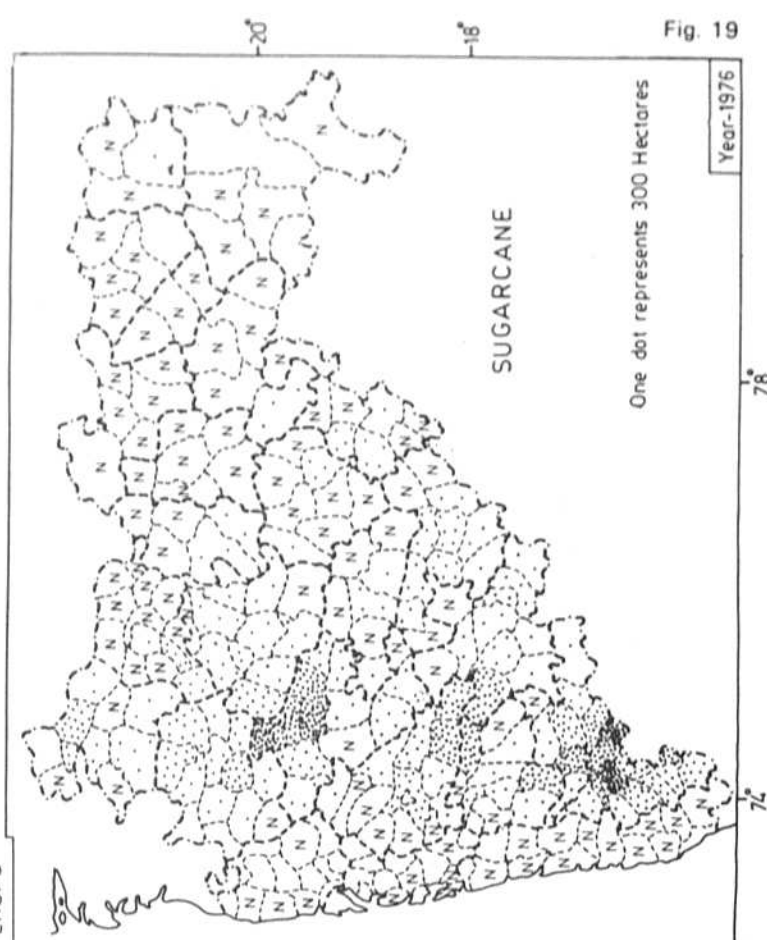
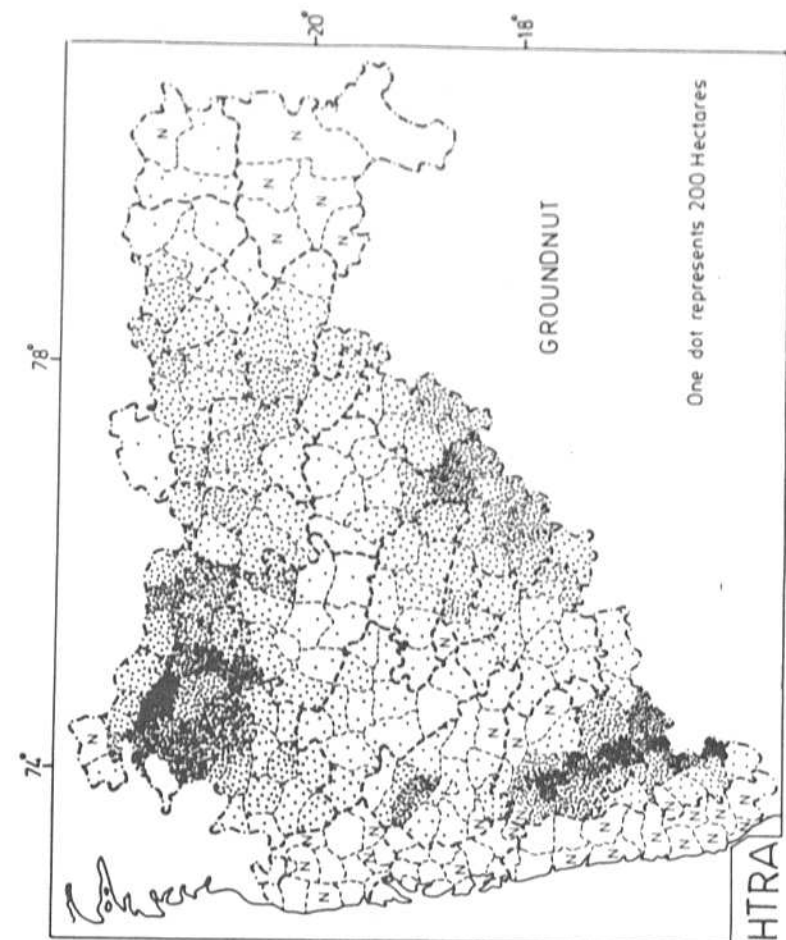
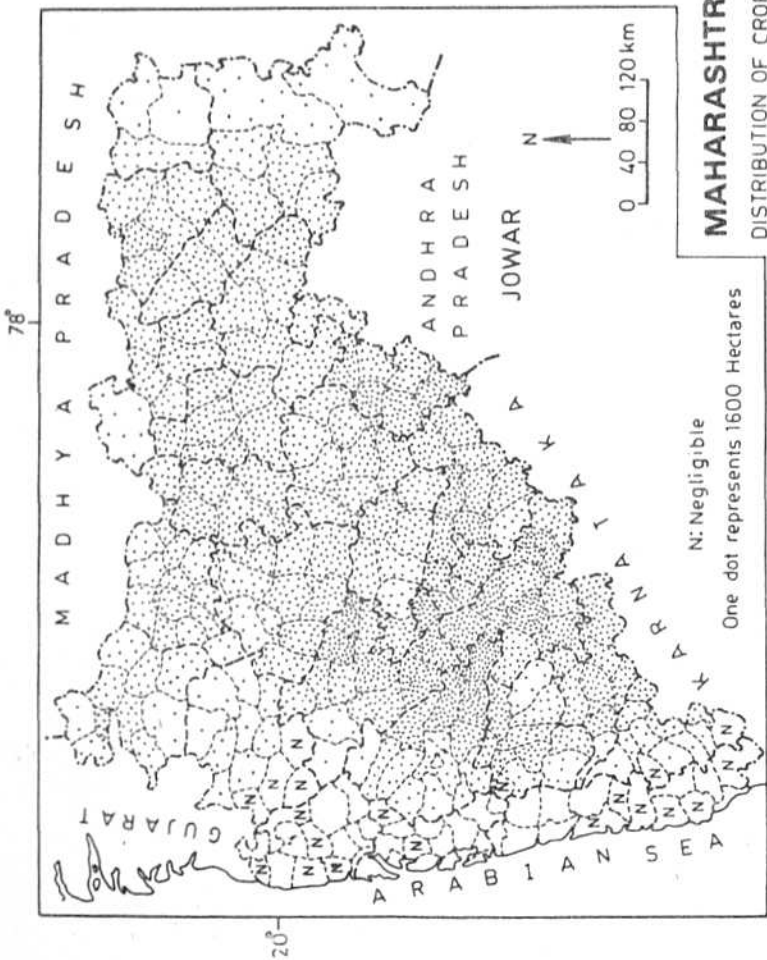
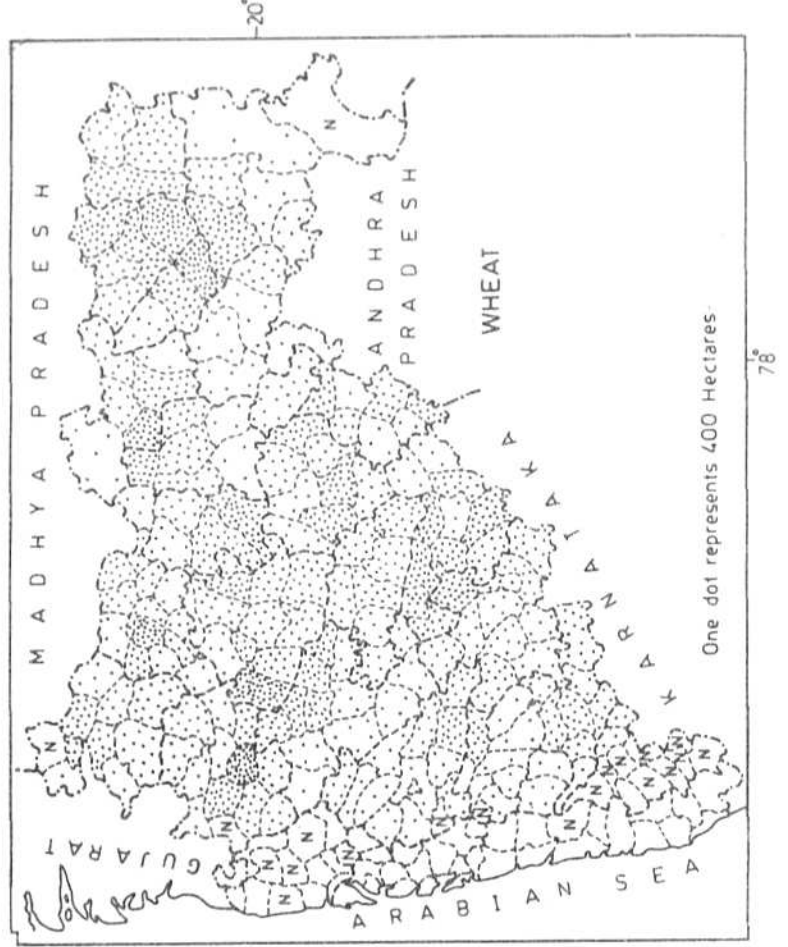
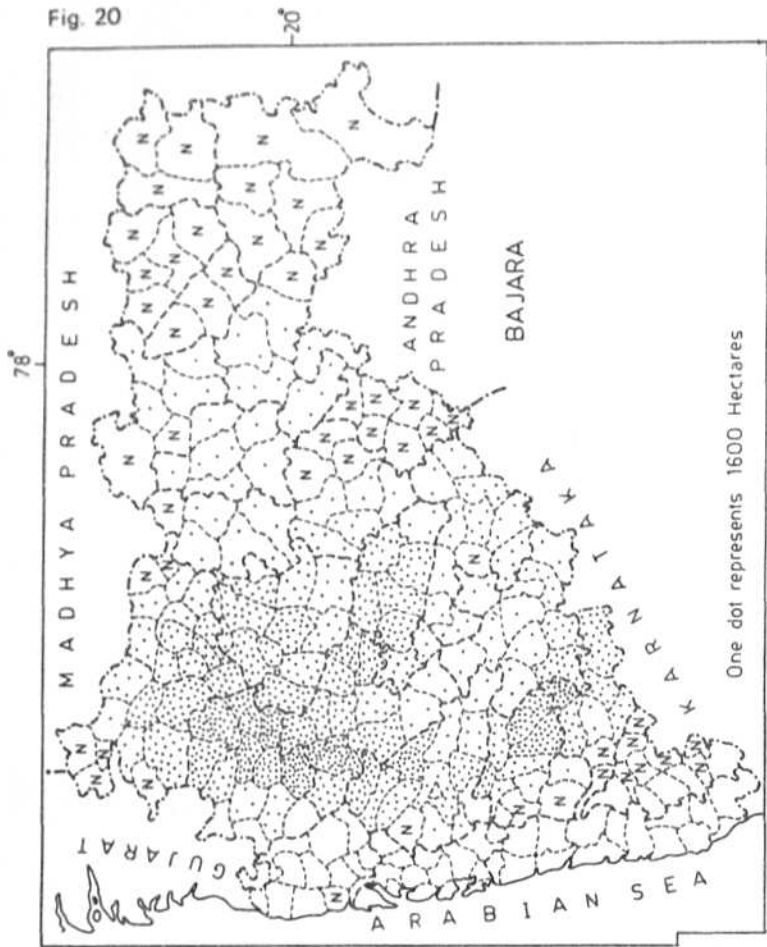


Fig. 19

Year-1976

DISTRIBUTION OF CROPS

Fig. 20



MAHARASHTRA
DISTRIBUTION OF CROPS

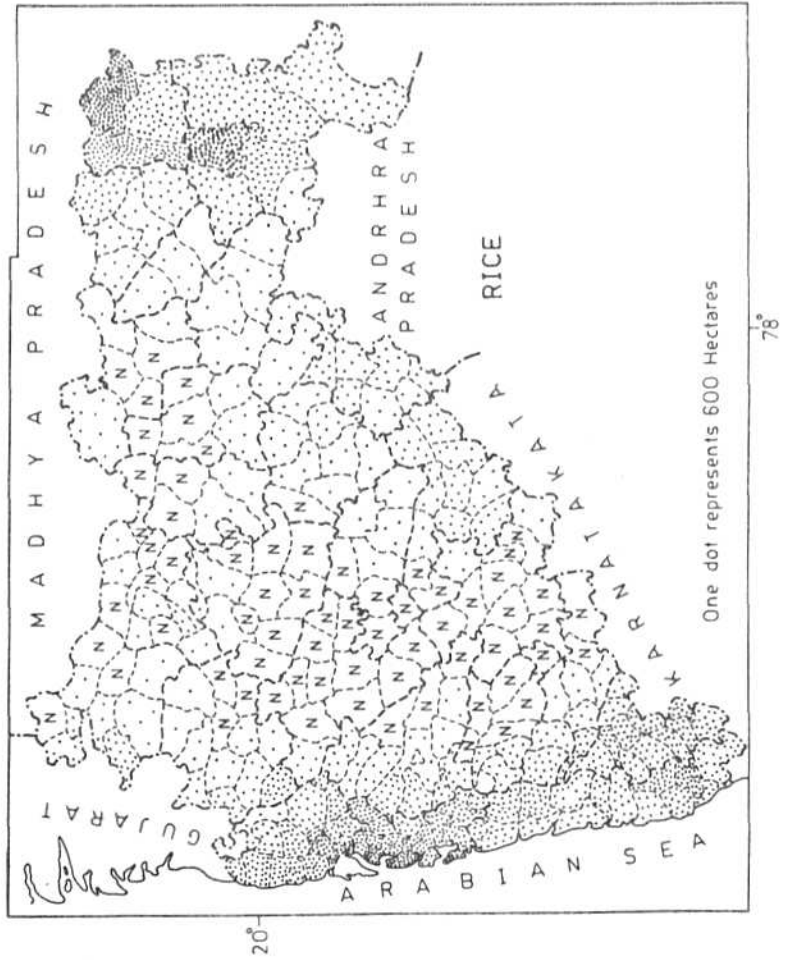
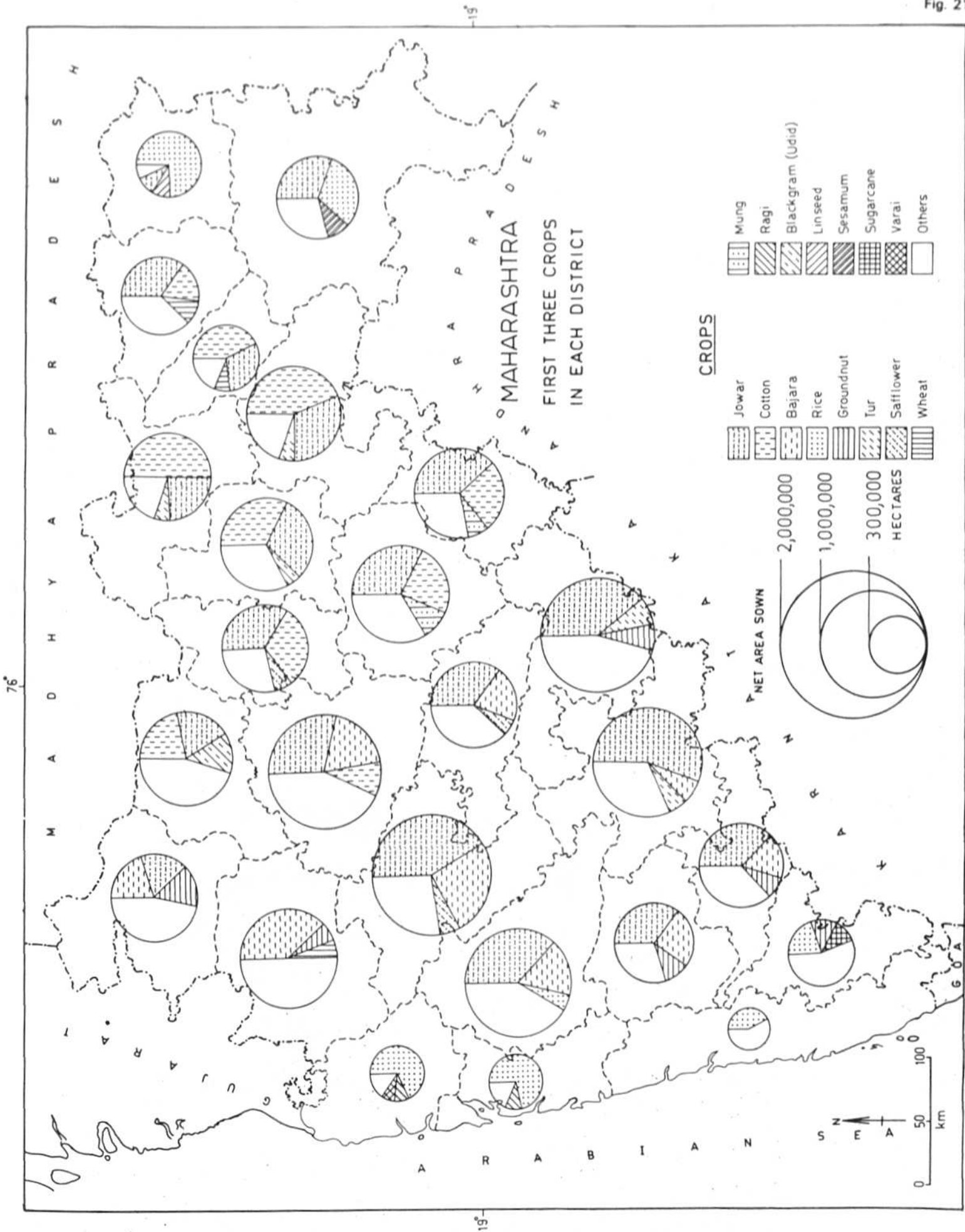
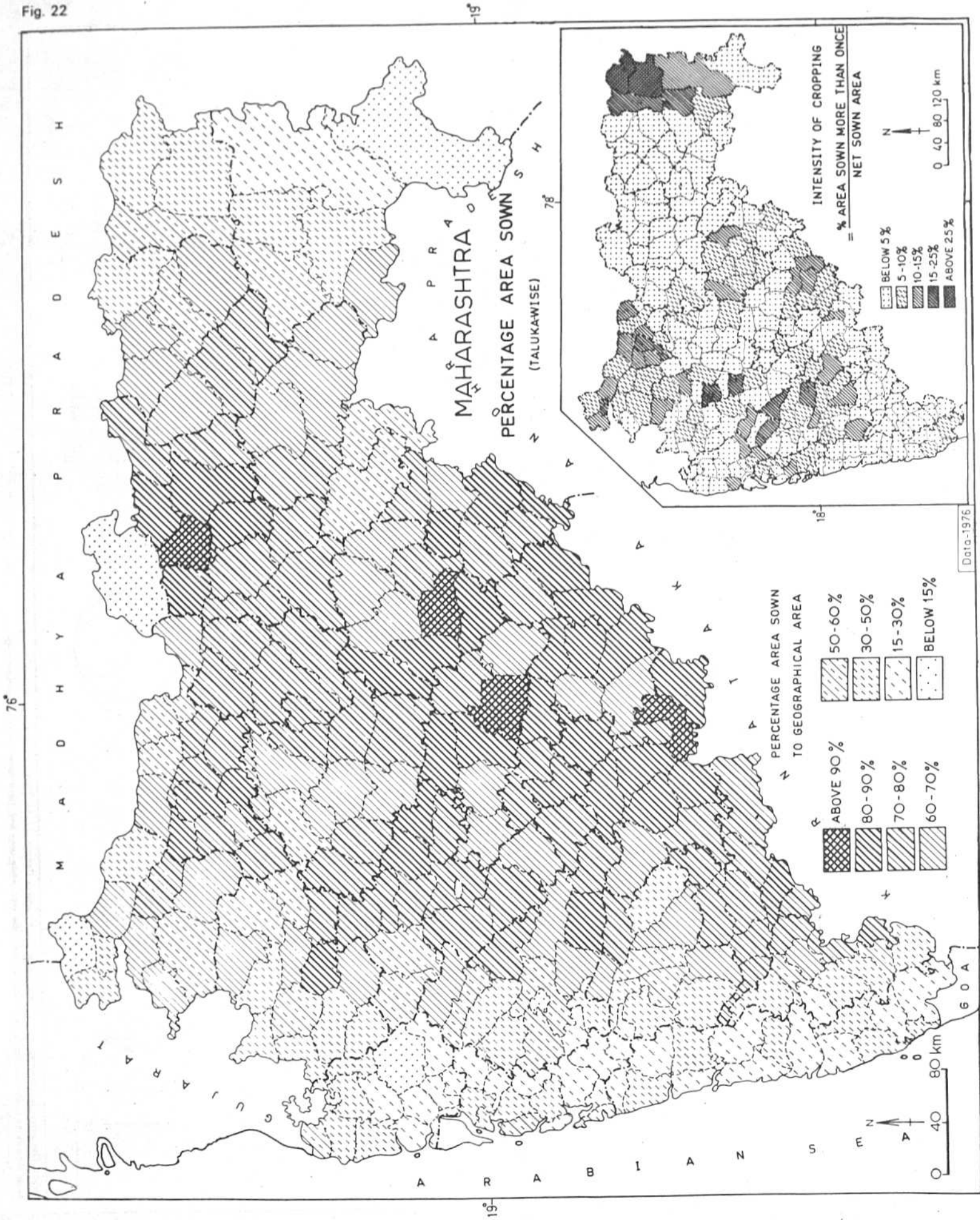


Fig. 21



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 22



Date-1976

Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Of late, there has been a noticeable shift both in landuse and the attitude of the farmers. Cotton, the traditional cash crop of Maharashtra has given place to sugarcane in Western Maharashtra. Thus, Maharashtra, that was once known for its cotton, is today known for its sugarcane, gur and sugar. In some areas canal irrigation has induced the cultivation of other fruitcrops like grapes, citrus fruits, figs and custard. Grapes in Nashik, Pune and Sangli, and bananas in Jalgaon are relatively recent introductions. The traditional growing of oranges in the area around Nagpur continues as usual. Other conventional cash earners, particularly in Western Maharashtra, are the onions and chillies. The Pune-Nashik axis particularly specializes in the cultivation of onions. Khed and Manchar, to the north of Pune and Lonand to the south, and Lasalgaon near Nashik are the important trading centres for onions and chillies. Thane, Nashik, Pune, Jalgaon and Nagpur are the five most important districts known for the cultivation of fruits and vegetables. Jalgaon remains the area of banana cultivation and Nagpur known for its oranges.

Innovations in agriculture.—There has been a vast change in agricultural practices during the last 25 years. Some of the changes have resulted from the innovations introduced in the field of agriculture. In an overview, increasing acreage under sugarcane and the springing up of sugar refineries, introduction of hybrid jowar, improved strains of cotton, extension of area under fruits, and greater use of fertilizers and modern implements could be mentioned as some of the innovations.

Sugarcane has not only changed the crop pattern, agricultural productivity and the landscape in Western Maharashtra, it has introduced new dimensions in the politics of the State by creating a powerful pressure group of 'bagaitdars', the sugarcane planters, and sugar co-operative societies. The role of sugar cooperatives is beyond the scope of this monograph, but it may be pointed out that the entire economic and political structure of Western Maharashtra revolves around these co-operatives. These have initiated a fair measure of welfare programmes, schools, colleges, hospitals and other institutions including allied industries that induce developmental activities. A tractor, the most common sight in any sugarcane tract, is used as a tiller, leveller, harrow and even as a means of transport. In fact, sugar industries provide the growth poles without their being named so. Dairying is another significant change. Though confined to the vicinity of urban areas, it has proved an important subsidiary agro-based industry. The pasteurisation plants have meant an assured market for milk and its sale and transport are well organized. The growing demand from large cities has encouraged floriculture on a moderate scale.

Vicinity to the metropolitan centre of Bombay, no doubt, has encouraged market gardening in its hinterland. Vegetables and fruits do not only find a ready market in Bombay but are also exported to other countries through Bombay.

Farmers and farming communities.—The peasant community in Maharashtra is largely composed of Marathas, Malis and Kunbis. The Brahmins as a class had some 'Inam' lands of which they were dispossessed under the 'land to the Tillers' act. The scheduled castes also have some agricultural land but their holdings being uneconomic, the land is actually cultivated by Marathas, since the scheduled caste people have neither the necessary infrastructure nor the finance to engage themselves in agriculture. The Marathas and Malis hold $\frac{3}{4}$ of the agricultural land. They are the 'Bagaitdars' who own the sugar factories control the politics in rural areas and tilt the balance in favour of one group or the other. The economic fortune of an average cultivator who practises jirayat cultivation still fluctuates with the monsoons, and the farmers of the Deccan barely earn their subsistence. Two things that have ameliorated their conditions during the last 30 years, are the acquisition of political power at the state level and increased agricultural productivity as a result of increasing irrigation. The change is confined to only irrigated areas; in Jirayat areas, the lot of peasantry has not changed much. The benefits of irrigation have exercised a demonstration effect on the peasantry even in areas where there are no canals. Small weirs across seasonal streams, percolation tanks to raise ground water level and more and more wells at suitable sites are being built with increasing frequency.

The village Panchayats, the Panchayat Samitis, the Zilla Parishads and the co-operative banks and such other developmental institutions cater to the needs of the farmers. These institutions also promote development, though the benefits do not always reach the small farmers. The productivity has certainly increased but social justice is not yet in sight.

CHAPTER X IRRIGATION

Irrigation is one of the many techniques meant to improve agricultural productivity. Water, besides a certain duration and amount of sunlight, a threshold of temperature, and a minimum of soil mineral nutrients, is essential to the growth of plants. In the tropics, temperature or sunlight being in plenty, the availability of soil moisture and soil nutrients hold the key to plant growth and agricultural productivity. No part of Maharashtra receives rainfall all the year round; nor is there any region where enough moisture in the soil is retained to sustain the crops all the year round. After generations of experience, the farmer in the Deccan has evolved a combination of crops that could thrive in the area, depending upon the amount and seasonality of rainfall and the quality of soil. The total return from the land in Maharashtra has generally been poor since the cultivation of land and raising of crops had to be confined to the rainy season, or the period when soil retained adequate moisture to feed the plants. Whatever little irrigation in Maharashtra there was, it was from the wells which were not perennial and some of which could not even yield sustained supply of water for the whole day. The eastern part of Maharashtra, a part of erstwhile State of Madhya Pradesh, has a tradition of tank-storage from which irrigation could be practised, but Western Maharashtra and Marathwada were devoid of any organized irrigation.

Inadequacy of moisture in the soil, near aridity conditions in some areas receiving less than 500 mm of rain and near absence of any worthwhile irrigation facilities produced a land-utilization pattern in which the rainfed cultivation predominated. Rice in the rainy Western part, bajra in thin soils, and rabi jowar and cotton in the thick black soil was the rule. The preference for jowar, a hardy crop, was obvious despite its low yield. Crops requiring longer growth period, or demanding a higher level of moisture in the soil, could not find a place in the crop pattern of the State.

A beginning of organized irrigation in Maharashtra was made in the early period of the British rule with the opening of the Krishna canal in 1870, which takes off from a point above Karad where a weir is built across the river Krishna. The water supply in the canal and the irrigated area fluctuates, as in the past, with the volume of flow, and is not very dependable since it is not backed by a storage. The first reservoir built for taking off canals was built at Khadakwasla in 1875. Thereafter, a few more canals linked with the reservoirs were opened up. These included the Nira left bank canal from Bhatghar reservoir in 1885, Girna canals, taken out from Chankapur reservoir in 1910, Godavari canals from Darna reservoir in 1911, Pravara canals from Bhandardara reservoir in 1920 and Nira right bank canal taking its supply of water from enlarged Bhatghar reservoir in 1930. From 1930 to 1954, the year in which Gangapur reservoir was completed, a period of 24 years, no new large scale irrigation work was undertaken.

Many of the irrigation projects that appear on the map of Maharashtra today are of recent origin unlike some of the irrigation works of north India which were constructed during the Muslim period, or some of the irrigation works of South which have a greater antiquity.

Today about one-tenth of the cultivated area of Maharashtra is under irrigation. This represents a substantial increase from about five per cent in 1951 to over 10 per cent of the cultivated area in 1980. This doubling of the acreage under irrigation is ascribed more to the increase in the number of wells than to any other source. This can be seen from the following table:—

T-10.1 *Area irrigated by sources (Hundred hectares)*

Sources of irrigation	1951-52	1960-61	1970-71	1974-75	Percentage of the net irrigated area
1. Govt. canals ..	2082	2128	2688	3193	19.81
2. Private canals ..	231	305	190	195	1.21
3. Wells ..	4047	5953	7679	9358	58.05
4. Tanks ..	1790	1925	2051	2321	14.4
5. Other sources ..	360	411	861	1051	6.52
Net area irrigated ..	8,510	10,722	13,469	16,121	100
Gross area irrigated ..	9,599	12,198	15,703	19,328	

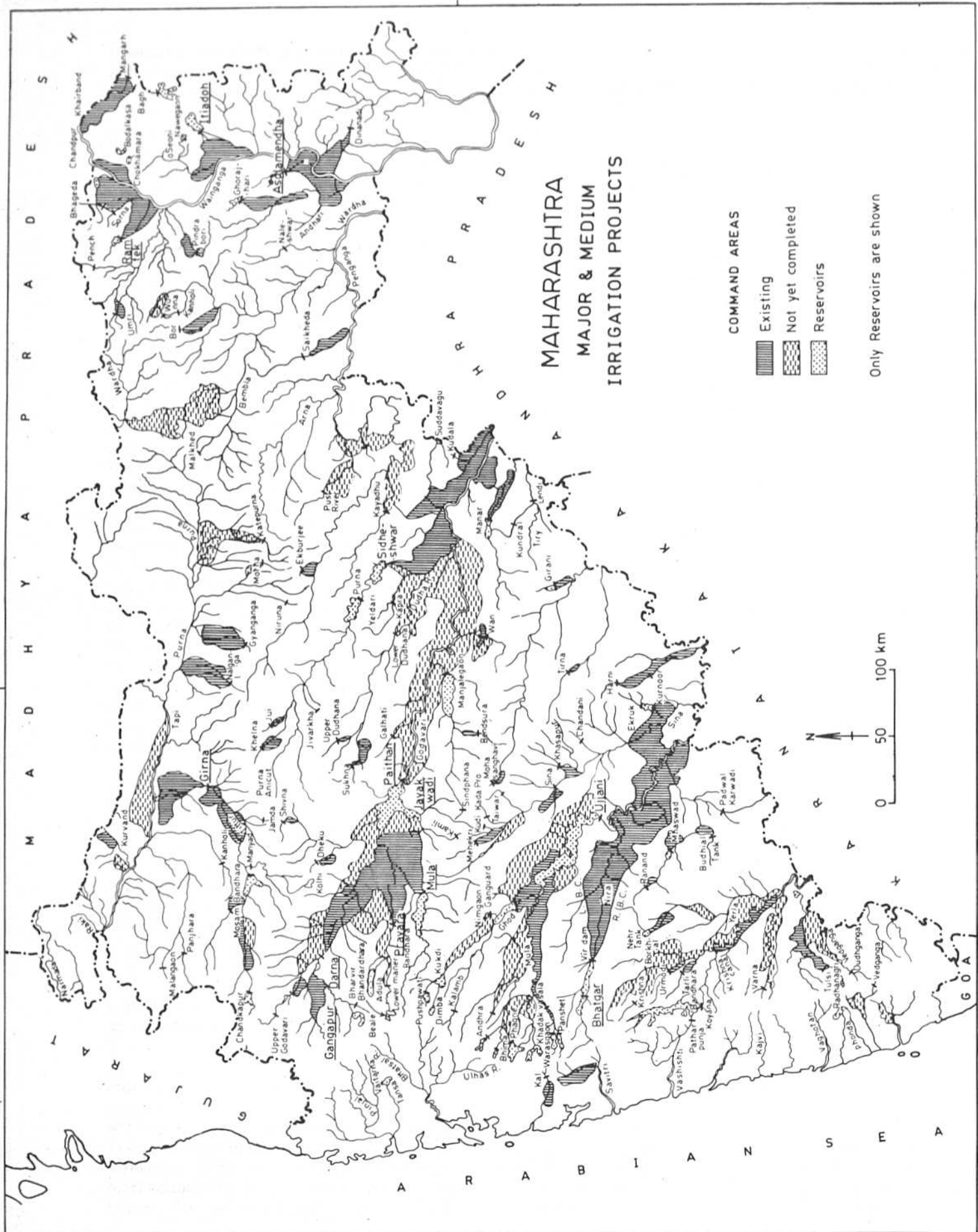
Except the cultivated land irrigated by private canals which has declined, there is an increase in irrigation from all other sources. The land under well irrigation has shown maximum increase and proves the effectiveness of individual enterprise. In fact, as compared to the huge sums of money invested in large scale irrigation projects, the amount spent on well construction is marginal and the benefits are far more. The farmers do not have to rely on Government for irrigation and can plan the cropping pattern the way that they find most convenient. The expenditure on management, supervision, laying of canals and the cost of administration is avoided. Yet, canals have an unfailing advantage over wells since most of the reservoirs are located in the heavy rainfall zone of Western Ghats, and seldom does it happen that the reservoirs do not overflow during the monsoons. Thus, even in the worst of years, there is an assured supply of water from the canals. The wells, usually the dug ones, are more or less the storage sites from the poor quality aquifers in the Deccan. The yields are low and a sustained supply of water all the year round is not feasible. In most cases, these wells are effective only part of the day when the stored water is completely drawn out, and the poor yield of the wells does not keep pace with the capacity of the pump. Thus, while the increase in the number of wells is a development in the right direction, irrigation from the wells is not a complete assurance against drought.

The area covered by a well is relatively small, varying from half an acre to two acres. This shows the minuscule nature of the well economy. In normal years, these wells are dependable and a source of sustenance to small landholders. In areas, where canals have not made their appearance, a well is the lifeline of the farmers, and a security against all odds. The site and the yield of the well determine the choice of crops and their distribution over the entire holding of the farmer. Over fifty per cent of the irrigated land, gets irrigation from wells, about a fifth from the Government canals, 14.4 per cent from tanks and the remaining from other sources. While the relative importance of wells has slightly increased, the share of Government canals has declined in the irrigation of the State. The private canals are confined to Ratnagiri, Pune and Satara districts. These consist of channels taken out from small dams across streams, often by the village community. Other sources include lifts which tap water from the river beds and are most common in Kolhapur, Sangli and Pune districts. The basic requirement for a lift is the presence of water in the river or groundwater in the river beds. A lift is an installation of pump, at a height close to the river bank that taps water from the river and allows it to reach the fields by gravity in small channels constructed for this purpose. The role of lifts in irrigation is significant in Panchganga basin. Kolhapur district virtually depends on lift irrigation and more than three-fourths of its irrigated area is irrigated by lifts. That the lift irrigation is so common in Kolhapur district and nowhere else in the State is a fact that needs investigation. A probable reason for this may be the enormous amount of sedimentation in Panchganga basin, and the coarse sediments in the river terraces which hold groundwater that replenish the river permanently. The sugarcane cultivation in Kolhapur region depends largely on lift irrigation unlike Ahmadnagar and Pune districts, where canal irrigated areas are the main growers of sugarcane.

Though all parts of Maharashtra, with the exception of Konkan, enjoy some canal irrigation, the Western region close to the Sahyadri benefits most. The other region which benefits equally is Wainganga-Pranhita basin comprising Chandrapur and Bhandara districts. Nashik, Dhule, Ahmadnagar, Pune, Satara and Solapur are some of the principal beneficiaries of canal irrigation in the State. It has to be observed that the development of large reservoirs is feasible only in the catchments with heavy rains and suitable topographic conditions. The source regions of most of the peninsular streams like Godavari, Pravara, Mula, Bhima, Kukadi, Ghod, Mutha, Nira, Krishna, Venna, Warna and Dudhganga provide suitable sites where storage reservoirs have been developed by putting dams across these rivers. In some cases, there are pick-up weirs, a few km down the main storage, from where the canals are taken out. Many of these irrigation works are old and date back to the last quarter of the nineteenth century. But, there are many new additions like the Krishna projects with dams on Krishna and Venna, Bhima project with a dam on Pawna and another at Bhima near Ujjani, an integrated Ghod and Kukadi project, and a major project on Godavari river called Jayakwadi project.

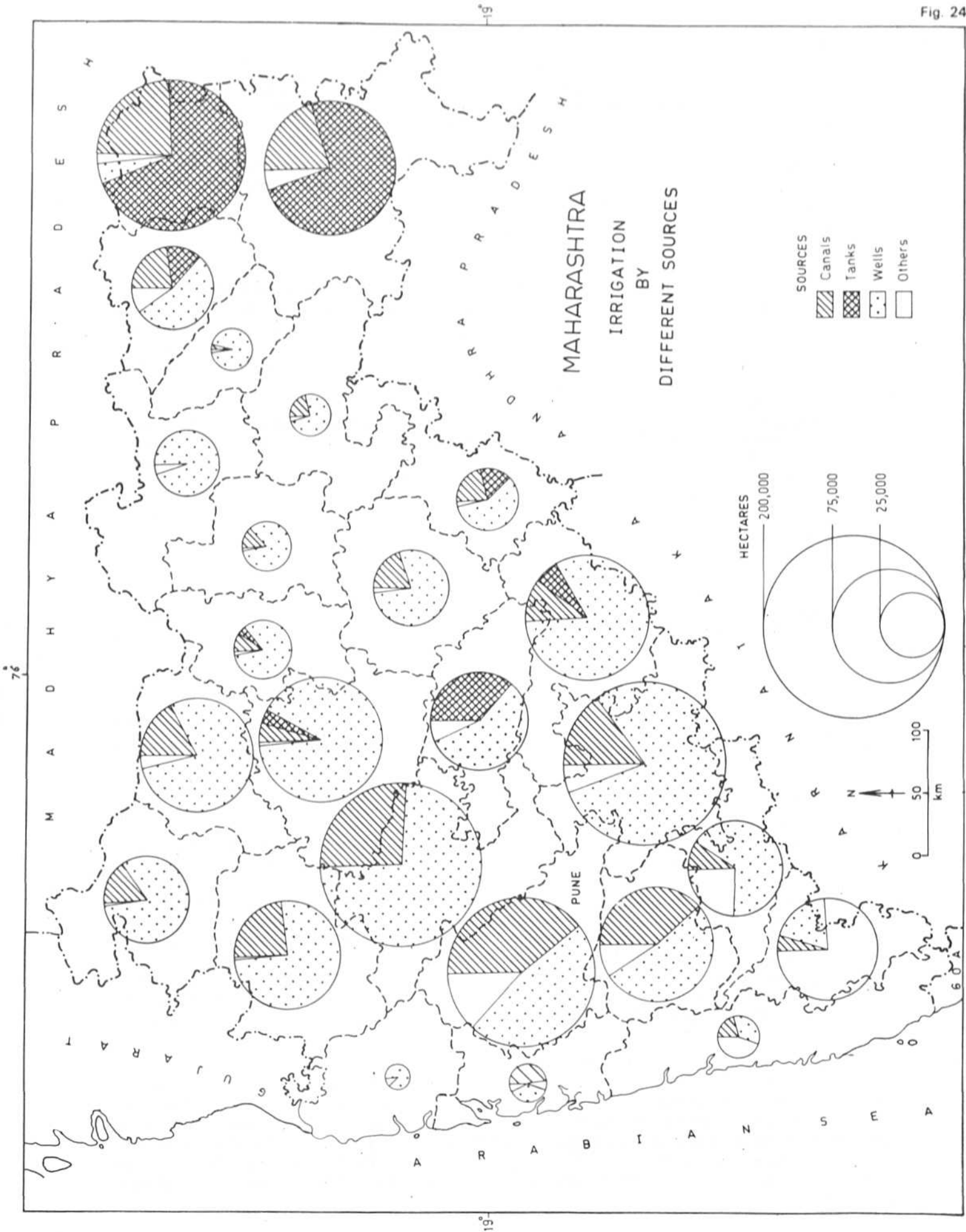
The Ujjani project on Bhima and Jayakwadi project on Godavari consist of dams across these rivers in relatively dry areas and the development of reservoirs. It is too early to say how useful these projects would be, but what is certain is that besides the submergence of some areas in the valleys and the consequent evacuation of many villages, these projects are bound to suffer as a result of heavy losses of water due to evaporation and seepage. Also, in less rainy years, these reservoirs may not be completely filled up. The catchment of these rivers above the dam-site are no doubt, large, but the contribution from the catchments will depend on their own water resources. In dry years, these reservoirs will have to

Fig. 23



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 24



depend on the rains in the Sahyadri, which lying a few hundred kilometres to the west may not cause a discharge at the dam-site large enough to fill the reservoir. The situation in Eastern Maharashtra where a few major projects like Itiadhoh, Ramtek, Gharajheri and Asolamendha get the benefit of a much heavier rainfall, is different and the water supply more dependable.

The increase in the area irrigated by canal irrigation is not as much as expected. Till 1975, out of the 2 million hectares of the gross irrigated area not even a fifth was under Government canals. In contrast, the position in 1950 was different when the share of irrigation by Government canals was more than one-fifth.

Tank-irrigation

Besides a moderate rainfall, a relatively level topography and an impermeable sub-soil are also necessary for tank storage. Broken land and hilly areas are least suitable for tank irrigation, since making of aqueducts and bridges require heavy investment. The eastern part of Maharashtra and particularly Chandrapur and Bhandara districts have a tradition of tank irrigation, and seventy to eighty per cent of their irrigated area receives water from the tanks. The only other district of Maharashtra where a significant acreage is irrigated by tanks is Beed.

The tanks in Eastern Maharashtra are commonly known as 'Malguzari' tanks. These date back to the British period when they were developed by the 'Malguzars' who owned much of the land. After the abolition of Malguzari rights, these tanks were taken over by the State Government of Madhya Pradesh and subsequently transferred to the Government of Maharashtra. A small number of tanks that provided irrigation to the lands of the 'Malguzars' are still under private ownership.

The distribution of tanks is as follows:—

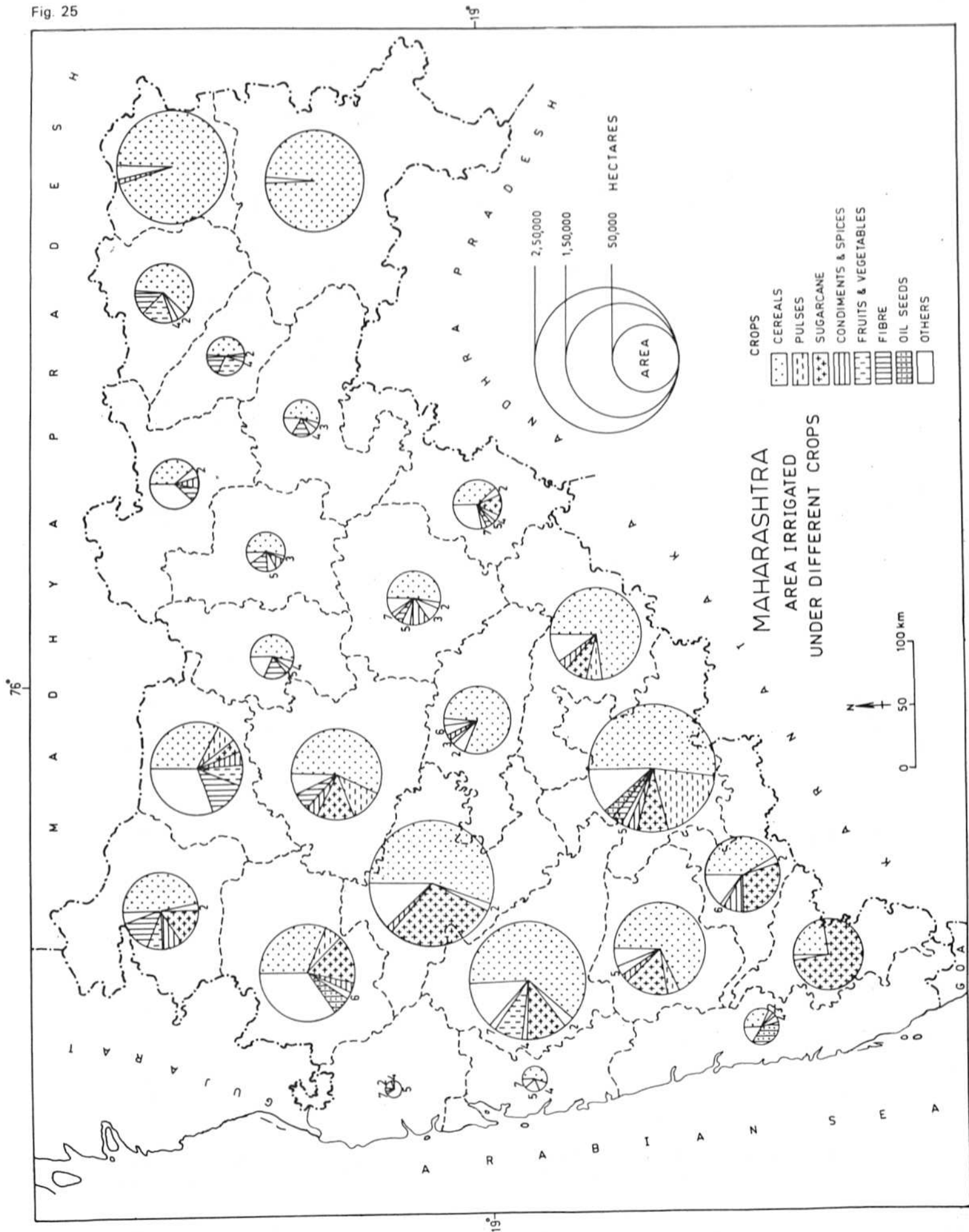
T-10.2 *Distribution of Tanks for Irrigation in Vidarbha*

District	Number of tanks	Area irrigated in acres (1962)
Bhandara ..	3,238	122,733
Chanda ..	3,466	107,599
Nagpur ..	175	8,014
Total ..	6,879	239,346

Out of this number, more than 150 tanks are large, each with a capacity to irrigate more than 250 acres of land. The tanks, a traditional source of irrigation, are of immense value for different reasons. Firstly, their maintenance is not costly. No infrastructure is needed; regular supervision and upkeep is not necessary and above all, they are, as a source of water, much cheaper than irrigation canals. The history of these tanks has brought to fore very many legal issues in so far as their use is concerned. A number of rights, nothing to do with ownership, like right of free water supply, fishing, cultivation of the dry bed of the tanks, have delayed their repairs. These rights are called 'Nishtar' rights, which were not abandoned concurrently with the Malguzari system and still continue. Notwithstanding the legal tangle, tanks are a precious source of irrigation but are likely to lapse into disrepair and turn dysfunctional. Already, land irrigated by tanks has dwindled because of their poor maintenance.

Irrigation and crops.—Irrigation has brought out significant changes in the landuse and the cropping pattern of the State. Firstly, large areas have been given to cashcrops or crops giving higher yields or higher cash returns. Thus, there is a considerable displacement of acreage from bajra and jowar to wheat, sugarcane and rabi jowar. Garden crops have developed in many parts as a result of the availability of water. The most spectacular result has been the expansion of area under sugarcane. There has been a four-fold increase in the acreage under sugarcane and a doubling of the area under wheat, since both these crops need irrigation, the former several times during the period of its growth.

Fig. 25



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

T-10.3 *Changes in the area under sugarcane and wheat in Maharashtra*

Crops	Years (hundred hectares)			
	1951	1961	1971	1976
Sugarcane ..	911	1,555	1,935	2,678
Wheat ..	6,764	9,067	9,783	11,691

In terms of the acreage under irrigation, the relative importance of different crops has changed over the years.

T-10.4 *Variation in area irrigated (by crops) in Maharashtra*

(Hundred hectares)

Crops	Years					
	1952-53		1965-66		1974-75	
	Area irrigated	Percentage of the total irrigated area in the State	Area	Percentage	Area	Percentage
1	2	3	4	5	6	7
Rice ..	2,410	26.98	2,487	17.92	3,494	18.08
Wheat ..	927	10.38	2,050	14.77	3,709	19.19
Jowar (rabi) ..	1,820	20.17	3,159	22.75	3,720	19.25
Bajri ..	288	3.22	276	1.99	680	3.52
Sugarcane ..					2,475	12.81
Food crops ..	8135	91.07	12,522	90.43	17,773	91.95
Cotton ..	61	0.68	472	3.4	761	3.94
Groundnut ..	88	0.99	259	1.87	210	1.09
Tobacco ..	13	0.15	11	0.08	10	0.05
Non-food crops ..	798	8.93	1327	9.56	1,555	8.05
Gross irrigated area ..	8,933	100%	13,880	100	19,329	100.00

The principal beneficiaries of irrigation in the state are rice, wheat, jowar and sugarcane. Of these, the acreage under wheat enjoying irrigation has increased four-fold and that under Jowar doubled. Rice was always irrigated in upland Maharashtra wherever higher return was to be ensured, but its relative position has dwindled and it does not claim the first place it used to. The impact of irrigation on the expansion of acreage under rice has not been as much as in case of wheat and sugarcane, the latter having tripled its area in a span of 25 years.

The irrigated area under each crop in relation to the total irrigated area in the State, though in itself significant, fails to convey the degree to which each crop is benefited *vis-a-vis* other crops.

The following table shows the irrigated area under each crop as a ratio of the total acreage under that crop:—

T-10.5 *Irrigated area under each crop as percentage of total area under the same crop*

(Hundred hectares)			
Crops	Net sown area	Irrigated area	Irrigated area as Percentage of the total area under a crop
Rice	13,572	3,494	25.74
Wheat	9,477	3,709	39.14
Jowar	60,229	3,720	6.18
Bajra	18,438	680	3.69
Sugarcane	2,475	2,475	100
Cotton	24,968	761	3.05
Groundnut	8,003	210	2.62
Tobacco	104	10	9.62
Gross cropped area of the State	195,056	19,328	9.91

Since rice grows in heavy rainfall area, it is only to grow a second or a third crop of rice or to overcome the effects a dry spell that irrigation is practised. Therefore, despite a very high acreage, next only to bajra, and a perpetual need of water, only 26 per cent of the area under rice receives irrigation. In contrast, wheat being a rabi crop needs irrigation for its growth. It is not a drought or cold resistant crop and in the absence of timely irrigation, its growth is retarded and the yields are poor. Irrigation is necessary for improved varieties of wheat which require heavy doses of fertilizers, and consequently water. Non-irrigated wheat is grown in deep fertile soils which retain moisture for a long period. Sugarcane is the only crop which does not grow without irrigation and the entire acreage under sugarcane has to be irrigated.

A very recent impact of well irrigation on the river terraces where groundwater is adequate is the appearance of fruit and vegetable gardening during the last twenty-five years. The horticulturists and floriculturists do not use canal water for fear of developing alkalinity in the soil, and most of the vegetable and fruit gardens, particularly the vine orchards, rely on well irrigation.

Regional distribution of irrigation.—The irrigated area of the State amounting to one-tenth of the net sown area is not equally distributed. Some regions have better developed facilities of irrigation than others. The plateau districts of the State bordering the Sahyadri on the east appear more privileged and enjoy a better developed state of irrigation facilities. In terms of acreage, Ahmadnagar district, though located on the plateau, heads the state and has more than 175 thousand hectares of land under irrigation. If the percentage of cultivated area under irrigation is taken into account, Bhandara and Chanda stand out. More than one-third of the cultivated area of Bhandara district is under irrigation, largely from tanks. The Panchganga basin in Kolhapur district, Krishna-Koyna plain in Satara, Mula-Mutha plain in Pune, Pravara-Mula lowland in Ahmadnagar and the Upper Godavari plain traversing

through Nashik district have not only developed fertile plains, but offered dependable sources of irrigation. The source water of these rivers and their tributaries have been harnessed by developing storage reservoirs, from which canals have been taken out. There are dams on Bhogavati, Warna, Venna, Krishna, Nira, Mutha, Bhima, Kukadi, Ghod, Mula, Pravara and Godavari, and most of these rivers are paralleled by canals irrigating considerable acreage downstream. Some of these irrigation works date back to the last century. Thus the western districts of Maharashtra are better placed in respect of irrigation, each having 12 to 15 per cent land under irrigation. In Tapi valley, Jalgaon district receives irrigation from Girna project and shows a fairly high irrigated acreage.

With the exception of Bhandara and Chanda where tanks are the principal sources of irrigation and irrigate over 70 per cent of the cultivated land, in all other areas, there is a positive association of canal with well irrigation. Wherever canal irrigation is dominant, well irrigation is equally important. The reason is not far to seek. The canals pass at relatively higher levels to irrigate the valley plains which are also the ground water bearing sites. Also, canal irrigation has raised the water table not only in the irrigated areas but even in the adjacent areas where wells have been dug to tap ground water. In areas like Ahmadnagar and Pune districts, an illusion is created that agricultural prosperity rests on the canals. This is not the case. In Ahmadnagar district over 70 per cent land is under well irrigation and in Pune half the irrigated area is under the command of wells. Wells are also an important source of irrigation in some districts of Marathwada, particularly Aurangabad which borders the Godavari, and Osmanabad which is drained by Manjra river.

Paradoxically, some of the areas though quite favourably situated to merit a high level of irrigation have remained behind. Nanded traversed by Godavari should have had the benefit of the flood plain of Godavari where well irrigation could have been developed. Similar is the situation with Parbhani district which though in Godavari plain does not have even 4 per cent of its cultivated land under irrigation. This kind of neglect of irrigation could be attributed to the poverty of the region, and its inland location. During the British rule and even earlier, development of irrigation was a major enterprise, and tapping groundwater far more difficult. In the absence of encouragement and support from the Government, the peasantry depended on dry farming and grew sturdier crops which needed less of moisture or had the capacity to tap water from greater depths. The growing of pulses in large part of Marathwada is explained by the absence of any reliable source of irrigation. Marathwada area, particularly the districts of Aurangabad, Osmanabad and Parbhani lead the State in the acreage and production of pulses. Another crop which thrives without irrigation though with poor yield is cotton. The cropping pattern is well adapted to the climo-edaphic situation and in the absence of irrigation no change has been introduced. One may attribute the neglect of Marathwada area, which despite being located in the basin of Godavari, did not have any worthwhile irrigation project, to an administration which was largely feudal, unconcerned with the condition of the people. This, however, could only marginally explain the situation. Even in the British provinces agriculture and irrigation never got the priority they deserved.

Besides Marathwada, the Vidarbha region, comprising Nagpur, Wardha, Yavatmal, Amravati, Akola and Buldana, is also equally under-developed in irrigation. These districts traditionally grew cotton in the rich deep-black soil that retained moisture for long, and the yield of the crop depended on the working of the soil, manuring and the subsequent care. Cotton, like 'Tur', one of the pulses, with a cycle of eight months, develops its foliage before the recession of the monsoons and bolls during the winter to yield cotton with the arrival of the warm season. Whatever little irrigation that is practised is meant for wheat and garden crops. Cotton benefits least. The districts of Chandrapur and Bhandara are a separate universe. Though a part of Vidarbha, they experience much heavier rainfall and have landuse dominated by rice which gets irrigation from the tanks and canals.

One may summarise the distribution of irrigation in Maharashtra by saying that a longitudinal zone making the western margin of the plateau comprising Nashik, Ahmadnagar, Pune, Satara and Kolhapur districts, has more of its land under irrigation and benefits equally from wells and canals. Ahmadnagar and Pune stand first and second in the acreage of irrigated area, followed by Bhandara and Chandrapur districts. But if the percentage of cultivated land under irrigation is taken as a criterion, Bhandara, Chandrapur, Satara, Pune and Ahmadnagar stand in the order of importance. Irrigation is not much developed in Marathwada, Vidarbha and Konkan, in the first two, because of a traditionally well adopted landuse, lack of enterprise and the poverty of the people, and in Konkan because of topographic conditions, poor soils which can support some crops, only during monsoon rains, and a relative paucity of groundwater resources. Konkan consists of a narrow longitudinal strip that is badly dissected, and

building of reservoirs and canals will not prove much of an economic advantage. The effort could be only localized in the narrow valleys where the farmers build small dams across streams, and take out water to the fields on the stream side in canals by gravity. In north Konkan, Thane and Kulaba districts, the relatively flat basins of Kal and Kundalika rivers offer a much better scope for irrigation from canals. So is the case of Thane district where large-scale garden crops and floriculture depend on well irrigation. Much of the land in Konkan is under rice and irrigation is practised only where a second crop of rice is grown.

Expansion of irrigation and irrigation projects

Despite the fact that the area under irrigation has shown considerable increase, from 900,000 in 1952 to over 2 million hectares in 1974, the situation is not very satisfactory, since not more than 10 per cent of the cultivated land is irrigated in the State. While efforts have been made in all directions and to tap all sources of irrigation, the main organized effort of the Government is directed towards major and medium irrigation projects. Most of these projects consist of developing storage reservoirs by impounding the water of some rivers, and taking out canals from them. Some of these projects particularly those with a potential of more than 10,000 hectares are given, in outline, below. The list of projects with bare outline details is basinwise, and includes even projects which are nearing completion.

Godavari basin

Kadwar river works.—This irrigation project spanning the Kolwan, Kadwa and Banganga river is in Nashik district. Completed in 1969, this project has the capacity of irrigating over 13,000 hectares of cultivated land.

Ramtek tank.—On Sir river, completed in 1910, has an irrigation potential of 10,520 hectares.

Godavari canals.—The project dates back to early years of the present century and consists of a dam across the river Dharna and a pick-up weir near Kopargaon. A perennial source of irrigation, the project has the potential of irrigating 32,150 hectares of land. In fact, this irrigation project has brought prosperity to Kopargaon-Shrirampur tract of Ahmadnagar district.

Pravara canals.—Close to Godavari canals, a little to the south-west, are Pravara canals, taken out from a pick-up weir much to the east of the main reservoir, called Bhandardara, located at the source of Pravara river, close to the Sahyadrian divide. The project exclusively benefits the north-western part of Ahmadnagar district. The reservoir has the potential for irrigating over 23,000 hectares of land. Completed in 1926, Pravara canals in conjunction with Godavari have made Ahmadnagar and part of Nashik district agriculturally prosperous. The length of the canals is 130.33 km.

Gangapur dam.—The project consists of dams on Godavari, Alandi nalla and Nasarda nalla, and was completed in 1960. The project close to Nashik, upstream, has more than 75 km length of canals and irrigates 16,790 hectares of land.

Purna project.—Completed in 1968, and also known as Siddeswar tank, the project consists of a storage reservoir on Purna, a left bank tributary of Godavari, and has 54 km of canal length with a capacity to provide irrigation to a relatively large area in Parbhani and Nanded districts. The irrigation potential of the project is much beyond what can be expected from the amount spent on it. The entire project cost over 18 crores of rupees and has developed potential for 61,500 hectares of land.

Manar project.—This project of a modest dimension irrigates more than 10,000 hectares of land and was completed in 1969. It is located in Nanded district and consists of a storage reservoir on Manar river. The project, like Purna, largely benefits Nanded district of Maharashtra.

Bor project.—Completed in 1969 the project consists of a dam across the river Bor, a sub-tributary of the river Wardha in Wardha district. It has brought considerable benefit to the cotton growers in the area and irrigates over 13,000 hectares of land.

Bagh project.—This is a medium size project in Bhandara district with an irrigation potential of over 33,000 hectares. It consists of an earthen dam 28.5 m high and 2836 m long across Bagh river near Sirpur village, a pick-up weir, 2974 m long and 19.5 m high, at village Pujantara and a 64 km long canal taking off from the pick-up weir.

Itiadh project.—The project consists of a 527 m long and 28 m high dam across the river Garvi, a tributary of the Wainganga, near the village Gothangaon in Bhandara district. With a canal length of 80 km on the right bank of the river, the project has a potential for irrigating 46,140 hectares of land in Sakoli taluka of Bhandara district and a large area in the newly formed Gadchiroli district.

Mula project.—The project, completed a few years ago, has developed a large storage reservoir called Gyaneshwar Sagar, by building an earthen dam, 2820 m long and 46.63 m high, across the river Mula at Baregaon Nandur in Ahmadnagar district. There are both right and left banks canals that will ultimately irrigate over 65,000 hectares of land.

Dinandi project.—Located in Chandrapur district, it consists of a 21 m high dam across the river Dina at village Regree. The project has 60 km of canal length and is capable of bringing irrigation to over 16,000 hectares of land.

Pus project.—A storage dam across the river Pus, a tributary of the river Wainganga, has developed irrigation potential for more than 11,000 hectares of land. The project benefits the wheat and cotton land in Yeotmal district.

Jayakwadi project.—This is the largest river project of Maharashtra in terms of its irrigation potential, which will ultimately be raised to 251,000 hectares of land, though in the first stage only 141,650 hectares of land will be irrigated. The project, located in Aurangabad district, consists of a 30.6 m high earthen dam in the first stage with a length of 10,000 m with a masonry spillway at Paithan, across Godavari. The first stage has 185 km long canals on the left bank which will benefit 141,000 hectares of land largely in Aurangabad and Parbhani districts of Marathwada. The project has the pride of a place in the irrigation system of Maharashtra.

Upper Godavari project.—This project close to Nashik does not involve Godavari directly and is principally related to its tributaries. The project consists of constructing four dams and storages, two across Kadwa at Karanjavan and Palkhed, one across Kalwan river at Waghad and the other on Unanda river at Ozarkhed. The project, still not fully operational will irrigate 42,270 hectares of land, when completed. The Palkhed dam across Kadwa has greater potential. It has provision for remodelling of the existing right bank canal and the construction of a new 102 km long canal.

Irrigation projects in Godavari basin in Maharashtra carry large potential. At present, the upper Godavari project, Gangapur dam, Godavari project (Darna river), Pravara and Mula Canal projects and Jayakwadi projects together with the projects on Purna, will bring the benefits of irrigation to several hundred thousand hectares of land. The irrigation potential of Godavari basin from surface water on the basis of irrigation commission report is as follows:—

		('000 hectares)
1. Existing major and medium projects	..	261.574
2. Existing major and medium projects under construction	..	401.94
3. Included in the 4th & 5th five-year plans	..	465.41
4. Major and medium projects proposed	..	1,090.70
	Total ..	2,219.624

Thus the total surface water irrigation potential which may be developed and available for irrigation in the near future is 2,219,624 hectares.

Krishna basin

Krishna basin occupies a much smaller area in Maharashtra as compared to Godavari basin, and the developed and potential resources of surface water are far less. A review of the existing irrigation projects that follows will demonstrate this fact.

Krishna canal.—Completed in 1868, this is the oldest irrigation project in Maharashtra and consists of a barrage across the river at Karad, with the surplus water channelised into Krishna left bank canal which has a length of 66 km. The project is not so important as it irrigates only about 5,000 hectares of land, but its antiquity attracts attention. The gentle slope of the 'Desh' from the Sahyadri eastward, has been exploited to regulate the flow in this canal. This canal changed the land use of Satara district quite early when sugarcane was introduced as a cash crop. The canal was further extended in 1966 leading to the irrigation of 9,000 hectares of additional land.

Some early projects

A number of small projects in Krishna basin were completed in the last century. They may not appear very significant today, but they certainly proved very effective in ameliorating the conditions about a century ago.

The following table summarises the early irrigation works in Krishna basin :—

T-10.6 *Irrigation Potential of some early Irrigation Works*

Name of the project,	District	Name of the river	Year of completion	Type	Irrigation potential hectares ('000)
1. Krishna canal	.. Satara	Krishna	1868	Flow	4.99 (now extended)
2. Ekruk tank	.. Solapur	Adhila	1871	Flow-cum-storage	3.24
3. Ashti tank	.. Solapur	Ashti nala	1881	..	4.73
4. Nehru tank	.. Satara	Yerla	1881	..	2.18
5. Mhaswad tank	.. Satara	Man	1884	Storage	4.45
21. Mutha canal	.. Pune	Mutha	1884	Storage & flow	6.80
22. Nira canals	.. Pune	Yelvandi & Nira	1885	..	82.73 Described in detail
23. Visapur tank	.. Ahmadnagar	Hanga	1927	Storage	1.38
24. Ranand	.. Satara		1958	..	1.09

Mutha canal.—Mutha canals were the first of their kind to be linked to a storage in Maharashtra, taking off from Khadakwasla. Built in 1884, the Khadakwasla reservoir was supported by another dam across the river, up in the hills, at Panshet. The Panshet dam breached in 1961 causing considerable loss of property at Pune located 10 km down Khadakwasla on Mutha river. It has since been rebuilt and the irrigation from Mutha right bank canal was resumed in 1966. The canal irrigates 6,800 hectares of land in Haveli and Dhond talukas of Pune district. The irrigated tract extends linearly parallel to Mutha river and thus the length of the canal (141.62 km) is disproportionately high as compared to the irrigated area. The irrigated tract being close to Pune (Khadakwasla, the outlet of the canals is 10 km up Pune on Mutha) has developed extensive vegetable and fruit gardens, floriculture and vineyards, besides sugarcane which has led to the development a sugar refinery at Theur not far from Poona.

Nira canals.—The project, one of the oldest in the State, has storage reservoirs with dams across Velvandi near Bhor and a pick-up weir on Nira at Vir, from where canals are taken out both on the right as well as left, with a total length of 432.42 km which irrigate 82,730 hectares of land. The Nira canals irrigate land in Poona, Satara and Solapur districts. Nira and Baramati and Indapur talukas of Poona district, Phaltan taluka of Satara and Malsiras, Akuj and Pandharpur talukas of Solapur district, bordering the river Nira receive irrigation from this project. The canal irrigates one of the most fertile part of Maharashtra that is completely transformed during the last fifty years. The introduction of sugarcane induced the development of sugar factories which dot the rural landscape. The Baramati-Phaltan area is known today for its quality 'gur' and sugar. Later developments include the development of vineyards and distilleries. Baramati is perhaps the only place a wine factory has been developed using local grapes as the basic raw material, and the wine produced has a wide market. Other crops include cotton and paddy.

Ghod dam.—This project completed in 1966, consists of a dam across Ghod Nadi down Sirur. The project has a potential for irrigating 24,620 hectares of land in Ahmadnagar district. The total length of the canal is 120 km. The canal system extends till the Ujjani dam on Bhima river.

Radhanagari project.—The project located about 50 km southwest of Kolhapur consists of a dam across Bhogavati river. The project is primarily intended to generate electricity, but has proved equally effective in irrigating about 10,000 hectares of land.

Besides the above projects, there are a number of projects in Krishna basin which are nearing completion.

Khadakwasla, stage I.—This consists of a 823 m earthen dam already completed across the river 'Ambi' at Panshet, and another dam across the river Mose at Warasgaon. The project is not different from the Mutha right bank canal, but after the breach of the Panshet dam 1961, the Khadakwasla dam was strengthened and Panshet was rebuilt. The irrigation potential of the project is enhanced to 22,300 hectares.

Warna project.—Lying in Sangli district the project consists of a 1458 m long and 58.52 m high earthen and masonry dam across the river Warna with two canals one on either bank. This is one of the major projects and has a potential for irrigating 100,000 hectares of land in Sangli district.

Bhima irrigation project.—This project consists of two widely separated dams and reservoirs. One of the dams is on Pawana river at Thagne near Wadgaon in Pune district and the other at Bhima near Ujjani in Solapur district. Both the dams are completed. The benefits from the waters of Pawana reservoir have started accruing to the farmers and the Pimpri Chinchwad municipal area. There are no canals taken out from Pawana dam and the water is lifted from small storages developed in the river by constructing minor Kolhapur type weirs. Ujjani reservoir is linked with the canals on both sides with a total length of 454 km. The ultimate irrigation potential of the project is 172,890 hectares of land in Solapur and Pune districts. The irrigation works including the canals are not yet complete and may take some time.

Krishna irrigation project.—The project is designed to tap the source waters of Krishna and its principal tributaries from the high rainfall zone of the Western Ghats. The project consists of three dams, two on the river Krishna one near village Dhom and another at Arphal and a third dam on the river Venna, a tributary of Krishna near village Kanher. The total potential of the project is the irrigation of 106,290 hectares of cultivated land in Satara and Sangli districts.

Kukadi project.—This is a project which integrates a number of schemes, and joins the upper reaches of Ghod and Kukadi. With a potential of 42,790 hectares of irrigation, the project has three dams and storages, two on Kukadi and one on Ghod. The dams on the river Kukadi are located at Manikdoh and Yedgaon and the one on Ghod is at Dimbe. The canals are taken off from Dimbe as well as from Yedgaon. The Manikdoh dam has only a reservoir. The total irrigation capacity of the project is 106,130 hectares in Pune and Ahmadnagar districts.

Besides the irrigation projects discussed above, there are a number of projects at an embryonic stage and some of the projects are still in the process of being finalized by the Planning Commission. Mention may be made here of Bhima lift irrigation project, Chaskaman project also associated with Bhima river, Koyna irrigation schemes and Wang project.

□ □



CHAPTER XI

POWER RESOURCES IN MAHARASHTRA

The State of Maharashtra is relatively poor in the conventional sources of energy, like coal and petroleum, and none-too-strongly placed in the generation of electrical energy. There are coalfields in the eastern part of the State, already discussed previously, which provide a meagre supply of coal, not exceeding 4,00,000 tons annually. Maharashtra was nowhere in the picture a few years ago as far as petroleum is concerned, but the seventies of the current century marked a turning point in the history of the State as well as the country with the discovery of oil rich structures in the continental shelf off Bombay, popularly known as Bombay High. Today, Bombay High produces 13 million tonnes of crude annually and accounts for more than half the total production of crude oil in the country. Mining is a federal subject, and the production of coal or petroleum does not benefit the State directly, but the indirect benefits are not to be discounted. The mining of coal in Nagpur and Chandrapur districts has entailed the development of an infrastructure which benefits the local populace besides promoting other developments like transport and communication and a number of ancillary industries.

The Bombay High oilfield, controlled, exploited and managed by Oil and Natural Gas Commission, a Government of India undertaking is a federal subject, but the advantages and benefits flowing from the proximity of this oilfield to Bombay are enormous. The State has no such royalty claim over Bombay High as Gujarat has on Cambay and Ankaleshwar oilfields because of the offshore location of the fields, but Bombay provides the base for all ONGC activities which include exploration, drilling, exploitation, transport, refining and distribution. The industries located in Bombay region provide market for petroleum and its by-products, and the industrial and financial institutions of the city offer the necessary monetary, engineering, organizational and infrastructural support. The location of a large fertilizer plant at Vaishet, gas turbines at Uran and a number of petroleum-based chemical industries in the vicinity are related to the production of crude from the Bombay High.

Generation of Electricity.—With the increasing use of electricity as the principal source of power, there has been a general switch over to the conversion of organic fuel and water into electricity. And the extent to which any country or region has been able to be self-sufficient in its energy sources depends as much on its capacity to convert coal, oil, gas and water into electricity as on procuring and developing these sources of power. There is, no doubt, a large segment of economic activity where petroleum still is important as a fuel or a raw material, but in so far as the requirement of energy is concerned, use of electricity, especially because of the ease of control and transmission, has come to occupy an important place among the sources of energy.

The State has been a leader in the production of electrical energy particularly the generation of hydel power in the early years of this century, and the supply position of power was always comfortable till about ten years ago. The rapid pace of industrialization, that the State has witnessed during the last ten years, has meant increasing demand of electricity, and despite a sizable expansion in the installed capacity and generation of power, the State is not able to meet fully the current demand of power from various sectors of economy. The expansion of the installed capacity and progressive increase in the generation of power can be observed from the following tables:—

T-11.1 *Installed capacity for the generation of electrical power (MW)*

Year	1951	1956	1960-61	1965-66	1971-72	1975-76	1980-81
Steam ..	65	225	443	653	1,051	1,401	
Oil ..	21	28	34	52	14	....
Hydel ..	253	280	282	599	844	1,175	
Nuclear ..	....	....	....	....	210	210	
Total ..	339	533	759	1,304	2,119	2,786	3,736

Today the installed generation capacity in the State is about 4000 MW. Along with an increase in the installed capacity for generation of power, the output of electrical energy has also increased 12-fold during the last 30 years—

Units of electricity generated in Maharashtra (Mkwh)

Year	1951	1956	1961	1966	1971	1976	1981
Steam ..	280	742	1,835	2,416	3,392	6,252	
Oil ..	32	39	68	62	1	....
Hydro ..	1,229	1,468	1,365	3,157	4,533	4,753	
Nuclear ..	....	....	....	....	1,209	1,047	
Total ..	1,541	2,249	3,268	5,635	9,135	12,057	19,200

The generation of electricity in the State is shared by the Government, private licensees and the Indian railways. The share of generation is as follows:—

T-11.2 Share of Generating Agencies in each type of Energy in percentage

Power generating organization	Steam	Hydel power	Nuclear power	Total
State Government ..	55.00	29.76	....	84.76
Central Government ..	....	....	4.41	4.41
Private Licensees ..	....	4.75	....	4.75
Railways ..	6.08	....	....	6.08
Total ..	61.08	34.51	4.41	100.00

Both, the installed capacity and actual generation are rapidly increasing in response to the demand from various sectors of economy. There are a number of projects at hand, both for the expansion of the existing generating units and addition of new plants. The thermal plants at Koradi (near Nagpur), Nashik, Bhusawal, Parali and Chandrapur are being expanded by adding more generating units, in addition to a proposal for a 500 MW thermal unit at Ujjani. A number of gas turbine units are being set up at Uran (near Bombay) with an installed capacity of 360 MW. The expansion of Koyna hydroelectric project, setting up of a new plant at Tillari, south of Kolhapur, and sharing with Madhya Pradesh the power generated from Pench valley project will substantially add to the total installed capacity of the State.

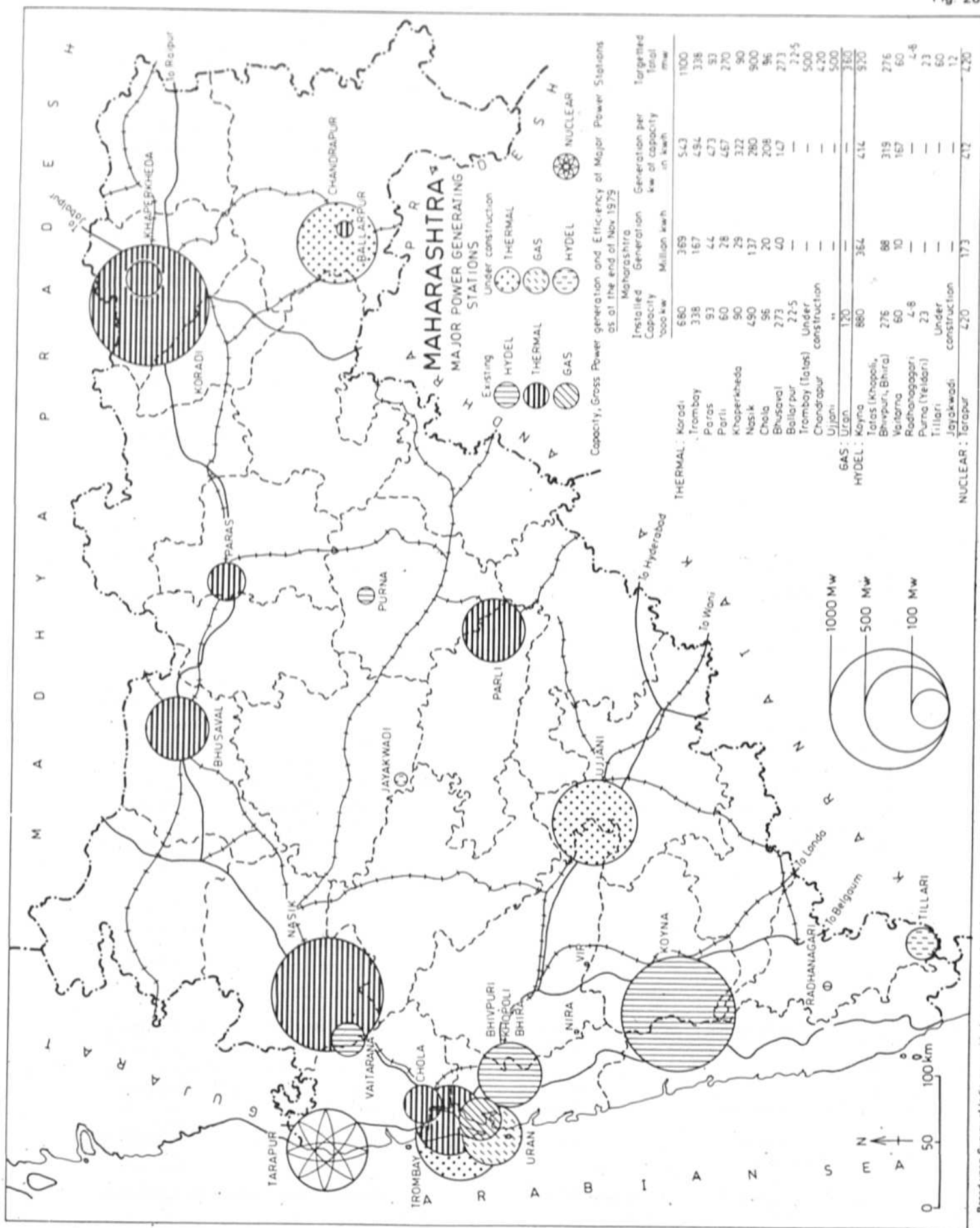
The requirement of electricity and the supply gap.—The demand for electricity in the State has been steadily increasing at an annual rate of 15 per cent. Despite a twelve-fold increase in the generation of electricity, the increasing demand is not adequately met and frequent cuts are applied as a measure of economy. The State has invested a large sum of money, and launched a number of projects but because of lack of effective implementation, it always falls short of achieving the target. The increase in demand is not only from industrial sector but also from agricultural sector, where increasing use of power is made for lifting water from rivers and wells and operating the tube wells. The inadequate supply and excessive load on existing generation has led to frequent load shedding, black outs, failures and regulated and curtailed consumption in urban areas, particularly during the summer when the water level in the reservoirs feeding the hydel power generating units goes down. The total availability of electric power in Maharashtra was 18,721 Mkwh in 1981.

The pattern of utilization of electricity shows industries as the largest consumer, followed by domestic consumption and power used for agricultural purposes. The utilization of power for different purposes is as follows:—

Utilization of electricity in Maharashtra (1980-81) for different purposes (in percentage)

1. Industries ..	56.35	5. Commercial ..	6.59
2. Agriculture ..	11.91	6. Inter-State ..	3.07
3. Public lighting ..	1.10	7. Traction ..	5.06
4. Domestic ..	12.29	8. Miscellaneous ..	3.65

Fig 26



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

While the industry has been always the largest consumer of electricity, the last twenty years have witnessed an unusual increase in the number of electrically operated pumps used for irrigation. In 1981 there were as many as 6,46,894 pumps in the entire State, using electric power. The pace of electrification of settlements is also on the ascent and every year more and more villages and towns are connected with the State Electricity Grid. About 28,000 settlements out of a total 36,000 are electrified. Certainly, much before the completion of the present decade, all the villages in Maharashtra will be electrified.

Growth of power generation in the State.—Till the end of the forties the generation and consumption of electricity was on a modest scale, and the State as a whole produced roughly 1,500 Million Kwh of power, the major consumers being the industry, Railways and Tramways and the domestic uses. This limited amount of energy was produced by small power houses using coal in many towns, while some towns had diesel generating sets. The Central Railways produced their own power from a thermal plant at Dombivali. But the bulk of the supply for the State came from the Tata hydroelectric project, with their three power stations located at Bhira, Khopoli and Bhivpuri, popularly known as three sisters. Bombay being a major consumer, the supply of electricity was regulated by Bombay Electric Supply Co. which used to buy bulk energy from the Tatas and distribute it in Bombay.

Generation of power and the location of power houses before independence.—As stated above, the generation and use of power was limited during the British days. Bombay was a major consumer. Other towns were small and depended on local power houses using coal or oil. The villages were not at all touched, farming was not mechanized and the village folks depended on crude or non-edible oil for lighting. There was no statewide organized generation or distribution, and a breakdown in any part meant a complete disruption of the supply of electricity till faults were rectified or repairs were effected. The present grid which not only covers the entire State but has an inter-state coverage did not exist. So many controls and sub-stations did not exist, and the electricity was largely produced and consumed for and by medium and large size towns.

Bombay had a disadvantageous location in so far as the availability of coal was concerned. The supply of fuel like coal or even petroleum necessitated a long haul from the coalfields of Bihar and oilfields of Assam. There was, however, one major factor in favour of Bombay, a relief with a steep escarpment of Western Ghats and plenty of water. As the industries grew, it was realized that the perpetual dependence on the eastern coalfields added to the cost and made Bombay's position less attractive and more vulnerable to fluctuation in coal production, which really it was. The house of Tatas perceived this difficulty and were quick to realize and exploit the vast hydel power potential of the Western Ghats. In this, they were helped by the relief and heavy rainfall of the Western Ghats. The Tatas built reservoirs on the plateau putting dams across east flowing rivers, developing reservoirs in their re-entrants, and diverted the water of these reservoirs through aqueducts, tunnels and steel pipes 600 m below, where they installed the generators. From South to North the three reservoirs developed by Tatas each feeding a power house at the foot of the Western Ghats on the west are as follows :—

Name of reservoir	Name of the river dammed	Location of power house	Height of the dam site
1. Mulshi lake	.. Mula river	Bhira (in Raigad district)	650 m.
2. (a) Valvan lake	.. A tributary of Indrayani river.	Both these lakes are joined by a tunnel, power house at Khopoli in Raigad district.	665 m.
(b) Shirawata lake	.. Kundli river		
3. (a) Andhra lake	.. Andhra river	Bhivpuri in Raigad district.	678 m.
(b) Gibbs lake	..		

Besides these hydroelectricity generating units, Tatas also operate a thermal power plant at Trombay with 337.5 MW installed capacity. The latest addition in the private sector is going to be a 500 MW thermal unit at Trombay to be installed by M/s. Tatas, and likely to be commissioned in 1983.

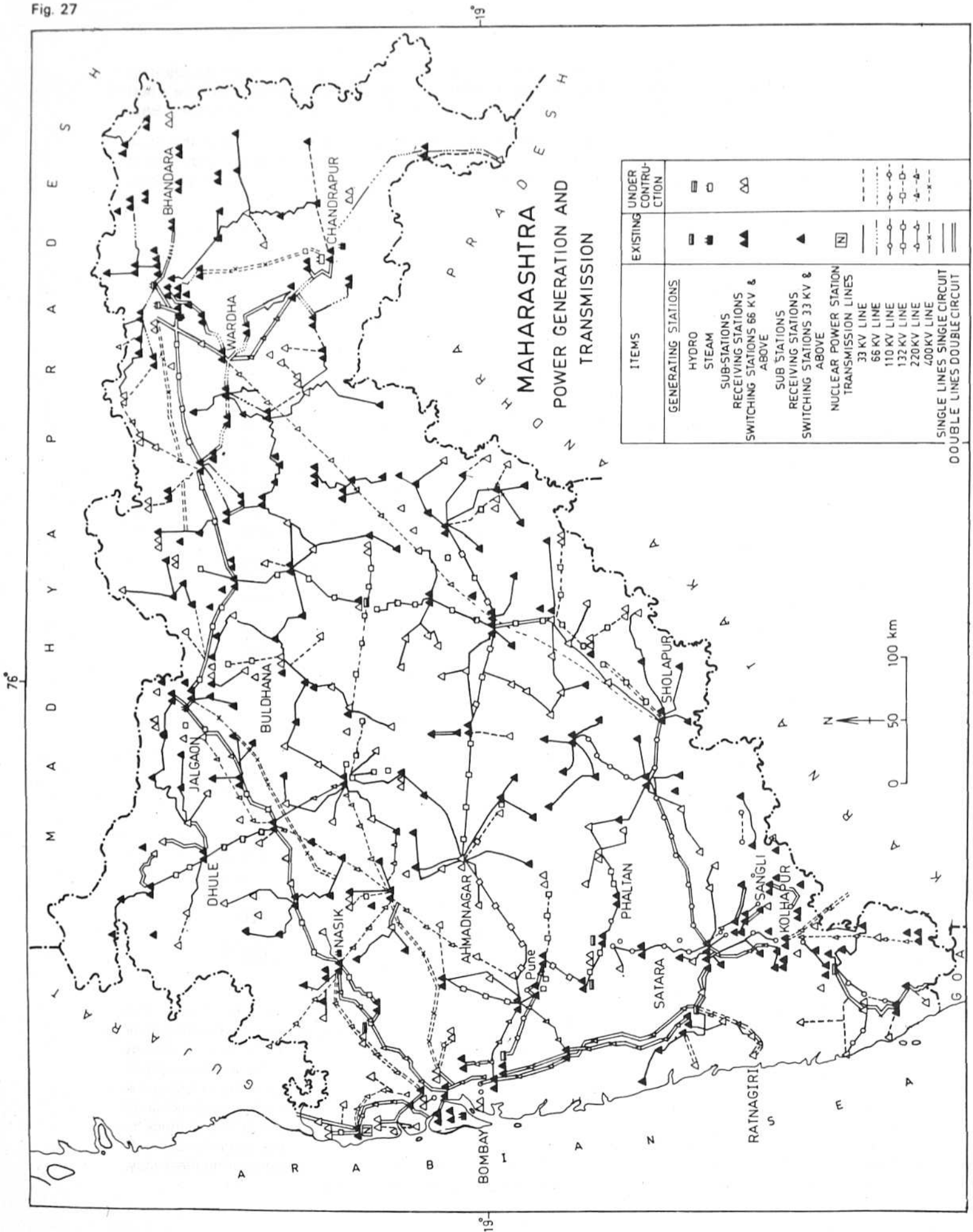
In the last few years, there has been no major venture to develop hydroelectric power by the State Government. Even the projects which are envisaged are minor, and would not mean much by way of addition to the existing installed capacity. The installed capacity of different generating units in the State is as follows:—

T-11.3 *Installed capacity for the generation of power in Maharashtra in March 1982*

				MW
<i>Thermal</i>				
Koradi	..	..	..	890
Trombay	..	..	..	338
Paras	..	..	..	93
Parli	..	..	..	270
Khaparkheda	..	..	..	120
Nashik	..	..	..	700
Chola	..	..	..	96
Ballarshah	..	..	..	22.5
Bhusawal	..	..	..	483
Chandrapur	..	..	..	420
Trombay (Tatas)	..	..	..	500
				3,932.5
<i>Hydroelectricity</i>				
Koyna	..	..	..	890
Tatas	..	..	..	276
Bhira	..	..	..	132
Khopoli	..	..	..	72
Bhivpuri	..	..	..	72
Vaitarna	..	..	..	60
Yeldari	..	..	..	23
Radhanagari	..	..	..	4.8
Bhatghar	..	..	..	1
				1,254.8
<i>Nuclear</i>				
Tarapur	..	..	..	420
Total ..				5,607.3

Location of the power generating stations.—The generation of power in effect means the conversion of energy from the conventional sources of energy like wood, coal, lignite, petroleum, gas or water into electricity. The conditions governing the location and the choice of the use of energy resources for conversion into electricity vary with the type of fuel used and the area of consumption. The overall consideration is the minimisation of cost of transport of fuel and the economy in laying the transmission lines, keeping in mind the minimum distance for the supply of fuel and the transmission of power. While the power stations using coal and petroleum can be built anywhere, effort is made to locate them as close to the fuel base as possible. The water power generation, on the other hand, needs plenty of water and a 'head' of several hundred metres to be used effectively for generating electricity, and there is hardly any choice about the location of hydel power stations.

Fig. 27



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The Hydroelectricity Generating Stations.—The hydel power generating units are tethered to a heavy rainfall and assured water supply areas with a head, usually provided by a fall or arranged by diverting the water from a high to a low level over steep gradient. The five important hydroelectricity generating stations are located at the foot of the Western Ghats escarpment receiving their supply of water from the reservoir built in the high rainfall catchment of east flowing rivers. A favourable topographic situation in the source region of these rivers is exploited to build a dam across these rivers and divert the water westward, to fall over 2000' at the foot of the Western Ghats. The Koyna, the Bhira, the Khopoli, Bhivpuri and Vaitarna are the five major hydel projects in the State.

Koyna the largest hydroelectric generating project consists of a dam across Koyna near Patan in Satara district. The reservoir called Shivsagar, running north-south is the source of water for the power house built at the western foot of the escarpment at Pophali. Similar reservoirs have been developed in the source region of Mulshi, Kundli, Andhra and Vaitarna rivers with power stations located down the ghats to the west. It must be mentioned that it is not only in Maharashtra, but in the whole of peninsular India that the generating of hydroelectricity is associated with the rainy heights of the Western Ghats. In the rest of Maharashtra the generation of hydel power is usually associated with some irrigation project where the installed capacity is usually low.

Thermal power

This consists of the conversion of thermal energy into electrical energy through generators. The thermal energy can be obtained from carbon fuel like coal, wood or lignite, from oil or even from gas depending upon the convenience. In Maharashtra, coal is the major fuel and, of late, gas is being used on a small scale to generate electricity at Uran, close to Bombay. Small generating sets operated by diesel were in existence till lately, but the development of an integrated system and the distribution of electricity having been taken over by the State Electricity Board, the small diesel sets are fast being closed.

In principle, the thermal generating plants are located at mine heads to save on the cost of coal transport, but since Maharashtra has a limited coal reserve, coal has to be brought from coal mines from the eastern region of the country. Of necessity, the location of the thermal power stations is tied to the main railway route. Thus Bombay and Nashik, in Western Maharashtra, Bhusawal, Paras and Parli in Central Maharashtra and Koradi, Khaparkheda (both near Nagpur) and Chandrapur in Eastern Maharashtra are all located on the railways to ensure speedy and regular supply of coal to these stations. The gas turbines which have been recently commissioned are at Uran in the vicinity of Bombay and depend on the gas obtained from Bombay High oilfield or from the gasfield north of Bombay.

The location of nuclear power station at Tarapur, about 100 km north of Bombay, is only to keep it at a safe distance from a major metropolitan centre, and near enough to rush any supplies or assistance during an emergency.

Distance is not a major constraint in the distribution of electricity. Transmission of electricity is easy and uncomplicated and can be accomplished by a network of sub-stations, receiving and switching stations and transformers. To be sure, there are losses in transmission, but this can be minimized by efficient management. Also, a break-down at any of the intermediate stations or a snapping of a link anywhere in the transmission system can cause disruption of power supply. Yet, the greatest advantage lies in instantaneous transmission of power to places thousands of kilometres away. In order that a breakdown at one station does not disrupt the supply all over, the generating stations are integrated and have been distributed in such a way that transmission distance is minimised and the losses are minimal.

□ □

CHAPTER XII

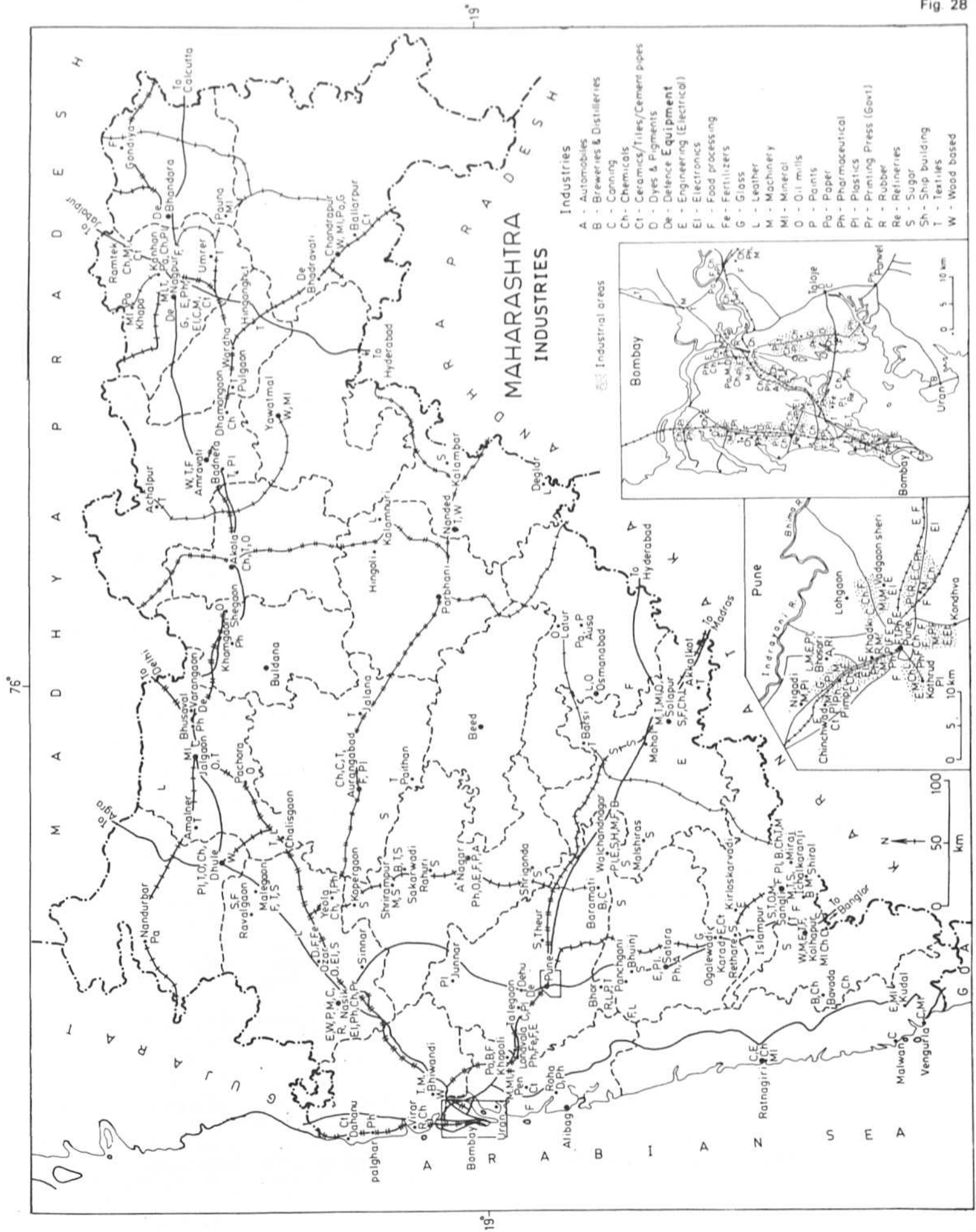
INDUSTRIES AND INDUSTRIAL DEVELOPMENT

With agriculture providing the industrial raw materials like cotton, groundnut and sugarcane, a reasonable energy base, a relatively better organized system of transport, an excellent trading situation, and adequate financial support from cities like Bombay, the latter being also the home of some of the foremost industrial houses in the country, Maharashtra has developed during the last thirty years into a leading industrial state of the country.

Ever since the British took possession of Bombay, it has always been an important trading centre, though not comparable to Calcutta which was then the port for a better developed hinterland with exportable commodities like tea, jute and some minerals. Bombay developed a little later, and taking advantage of cotton grown in Vidarbha and Khandesh, and its coastal location, became an important textile centre, though lagging behind the eastern industrial region. During the post-independent period, a number of factors contributed to the rise of Bombay as a premier industrial region of the country. Proximity to western countries, excellent port facilities, a promise of unrestricted supply of power particularly after the commissioning of Koyna hydroelectric project, disturbed labour conditions in, and the withdrawal of patronage from, Calcutta, of the British who had developed a commercial and industrial base from the days of East India Company, led to a virtual stagnation of Calcutta and a concurrent rise of Bombay. The eastern region still has a virtual monopoly of mining and metallurgical industry, and many of the public enterprises have preferred the region because of its mineral and fuel base. A tremendous shift in the location of engineering industries has, however, taken place despite not only the dominance but hitherto a virtual monopoly of the eastern region in the production of iron and steel, and a large number of engineering industries have emerged in Bombay region. Some of them even shifted to this region from Calcutta's very hinterland. Improved power position in Maharashtra, after the commissioning of Koyna hydroelectric project, and plenty of water from the Western Ghat region have worked as a positive influence in the growth of industries in Bombay-Pune region. One factor which must be mentioned and which will justify Bombay's comparison with Calcutta is the labour problem in West Bengal. The left sponsored agitation in Calcutta region and its intensification to the level of violence in the sixties and seventies created unstable conditions and repelled both capital and enterprise.

Bombay was, and continues to be, the focal point of industries in Maharashtra. Before 1960, the year of the creation of Maharashtra and Gujarat as two separate states out of the larger bilingual Bombay State, fears were expressed that non-availability of capital from Gujarati entrepreneurs and shifting of industries from Bombay to Ahmedabad may take place following the bifurcation of bilingual Bombay State. Both these fears are proved unfounded and the economic gains resulting from the locational advantages of industries have far outweighed the emotional sentiments based on linguistic affinity. Maharashtra has demonstrated a vigorous growth even after bifurcation. During the last 25 years, a number of additional industrial areas like Pune, Kolhapur, Ahmadnagar and Nashik have sprung up to relieve the congestion in Bombay and accommodate the spurt in the growth of new industries. In fact, the development of industries in Bombay and Pune, has given rise to a larger Bombay-Pune bifocal region. Today, Maharashtra has a very diversified composition of industries. Ranging from textiles, chemicals, plastics and rubber, to fertilizers, metallurgical and engineering, automobiles and shipbuilding, all form parts of the giant industrial complex in the Bombay-Pune region of Maharashtra. With over 11,000 working factories which constitute 16.8 per cent of the total number in the country, 25.4 per cent of industrial output, 26.8 per cent of the total value added and 14.5 per cent of the total employment, Maharashtra is the most industrialized state in India. It has a wide range of industries spread in several parts of the State, but concentrated largely in the Bombay-Pune-Kolhapur belt. Textiles, chemicals, food processing, engineering, automobile and transport equipment pharmaceuticals, machine tools and a host of other industries are located in the State. An overall assessment can be roughly obtained by comparing the number of industries and employment in Maharashtra and India.

Fig. 28



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

T-12.1 *Number of Factories in Maharashtra*

	Maharashtra		India		Maharashtra	
	No. of Factories	Employment	No. of Factories	Employment	As % of India	
Registered factories ..	14,346	11,32,336	89,238	56,03,892	16.08	20.21
Unregistered factories ..	1,22,142	3,41,082	13,14,741	33,13,481	9.29	10.29
Household industries ..	2,04,728	3,49,493	20,80,054	38,03,747	9.84	9.19

Textile industry.—Maharashtra, and more specifically Bombay is a traditional centre of textiles, a position which it still maintains. The textile mills developed in the early twentieth century have undergone considerable expansion and modification. The factors that favoured Bombay were humidity and easy availability of cotton from the hinterland. Even for better grade cotton textiles produced from long staple cotton, Bombay, being a port was a convenient location. The introduction of synthetics has not made much difference, and the city continues to maintain its importance as the main textile centre of the country. Though the number of registered factories engaged in spinning and weaving in the State is over 350, the number of textile mills is only 103, with about 5 million spindles. This is more than 20 per cent of the total capacity for the country as a whole. Besides Bombay, other places where the textile mills are located are Nagpur, Solapur, Nanded, Aurangabad, Jalgaon, Pune and Kolhapur. If, besides spinning and weaving, ginning and baling is also included, Maharashtra has over 1000 cotton textile factories employing 2.8 lakh people. Woollen and synthetic fibre textiles have another 465 factories with an employment of over 45,000 people. Of these, silk and synthetic fibre factories are largely confined to Bombay and Thane. About 20 to 25 per cent of the factories and 60 per cent of the employment in textiles is accounted for by Bombay alone.

An important segment of the textile industry is the handloom and powerloom industry. The total number of handlooms, operated in the State, numbers around 80,000 producing 15-crore metres of cloth. Nagpur and Solapur are the two principal centres of handloom in the State followed by Kamptee, Maindargi, Ahmadnagar and Umrer. Nagpur city alone has over 23,000 looms and Solapur over 15,000. More than two-thirds of these handlooms are based in the families of traditional artisans, who provide roughly 1/3 of the total work force. The distribution of powerlooms is not quite the same as that of handlooms. Unlike handlooms, about half the powerlooms are located in Bombay and Thane. Kolhapur and Nashik have also entered in a big way. The change to powerlooms appears related to proximity to Bombay. There are more than 1,25,000 powerlooms in the state. Bhivandi in Thane district and Malegaon in Nashik district are well-known powerloom centres.

The handloom and powerloom industry represents the survival of artisans from the pre-British days. Despite the giant textile mills with their mechanical efficiency, the looms operated by individual families and master weavers have been able to stand competition from the mills because of their low overhead charges, the initiative, skill and interest of the traditional weavers and the encouragement given by the State through tax exemption and liberal loans. In most cases, the artisans are Muslims who have kept their art alive and have turned the power operated looms to their advantage to compete with the mills.

Engineering industry.—The second important group of industries is the metal and machine manufacturing industry. There are two principal centres of machine manufacturing in the State, Bombay, Thane and Pune. Satara, Kolhapur, Nagpur and Nashik are secondary centres. Unlike textiles, engineering industry came to Maharashtra late, much of it during the last twenty-five years. Paradoxical though it might appear, certain factors but above all greater political stability and a well disciplined labour force have exercised enormous weight in favour of Bombay region to emerge as India's premier industrial region. Away from the raw material, a two-stage transport, first from the pig-iron and steel producing region of eastern India and then to the market, and a location none-too-central have not been a serious deterrent to prevent the growth of engineering industry in this region. Automobiles, sugar and cement plants, dairy equipments, tools, oil and diesel engines, pumps, vans and trailers, trucks, scooters and motorbicycles are some of the main engineering industries.

The most spectacular aspect of this development is the Bombay-Pune string development of industries. Following the transport routes, industries of all sorts have sprung up in the vicinity of these two cities. Kolhapur, another nucleus of engineering industry is particularly noted for its foundry works and Ahmadnagar for structural fabrication. Walchandnagar and Kirloskarwadi are other secondary centres of engineering industry.

Electrical goods and appliances.—An industry closely associated with engineering industry is the one producing electrical goods and appliances. These include motors, transformers, small generators and other equipment needed in the transmission and control, like cables and stabilizers. Electrical goods are produced on all scales. From giant firms like Voltas, Cromptons, Phillips and Siemens, to small manufacturers of holders and plug-pins, the industry produces a wide range of goods. The giants like Siemens and Phillips are located at Pune, Power Cables, Cromptons and others in the vicinity of Bombay.

Chemicals.—Maharashtra produces 40 per cent of the total output of chemicals in the country. These include heavy chemicals, dyestuffs, chemical products and pharmaceuticals. Many of the chemical producing units are located in Bombay-Pune region for reasons of ready availability of raw materials but no less because of markets. The textile industry provides ready market for starch, dyestuff, sizing material and other chemicals. There is a ready market for pharmaceuticals. Not that the drugs are not required in other parts of the country, but effective demand related to the income level appears more important from the producers point of view than the actual need. One factor in favour of the location of pharmaceuticals away from the market, is their low bulk and low transport cost. Bombay was already the home of ICI (Imperial Chemical Industries) which attracted a number of pharmaceutical concerns. Most of the leading pharmaceutical concerns have their plants in Bombay. The Government run antibiotics factory is at Pune. With a large complex of hospitals, chemical laboratories and research institutes, Bombay provides an ideal site not only for research and development but even for testing of chemicals and drugs. Many of the drugs are imported in bulk. To save them from contamination, they are promptly processed, capsuled and packed without letting them travel further to far off destinations.

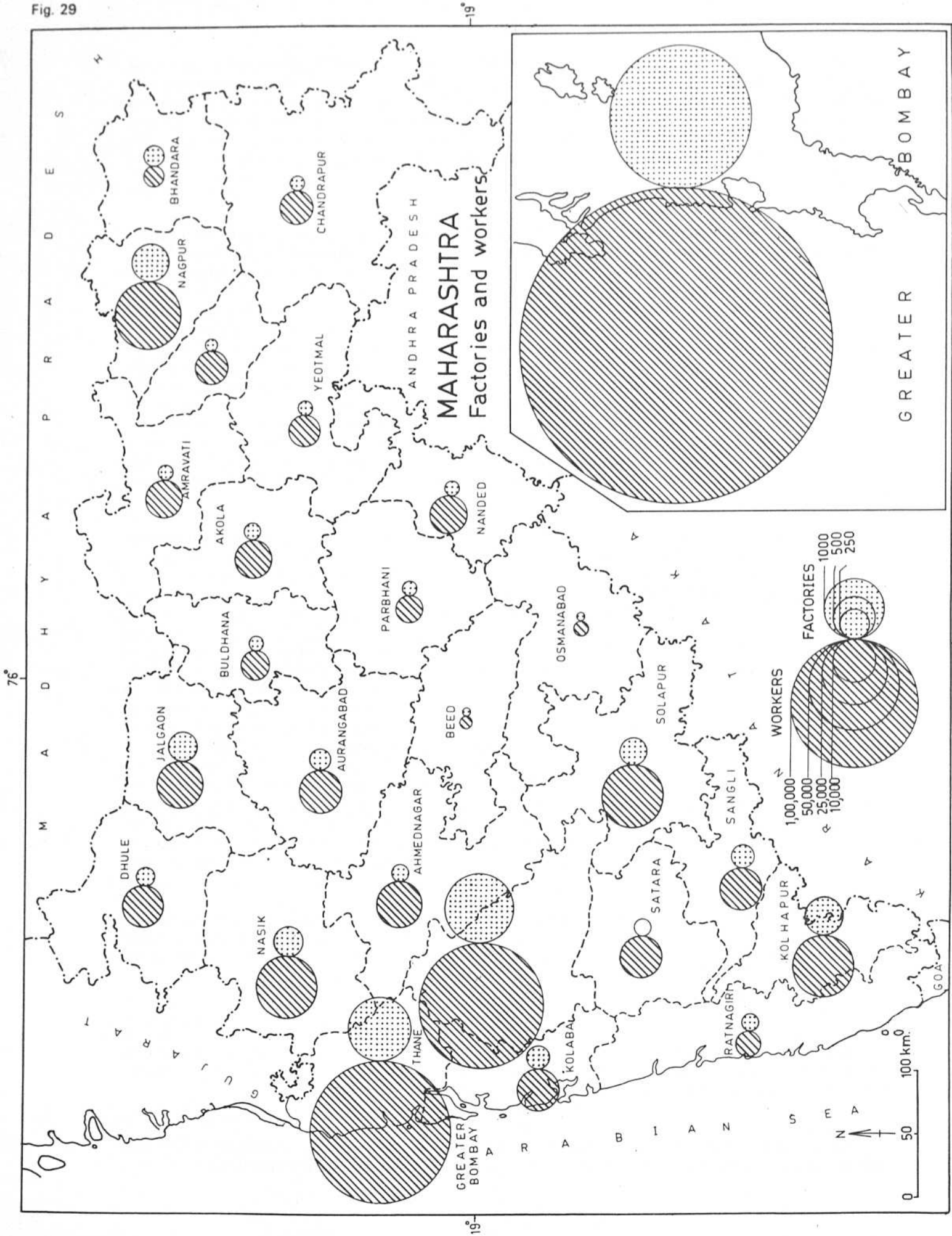
Sugar industry.—An agro-based industry, sugar refineries have assumed considerable significance in the economy and life of rural Maharashtra. There are in all 70 sugar factories in Maharashtra, 10 joint stock and sixty in the cooperative sector. As is expected, these factories are tethered to the sugarcane producing areas of the State, which, in turn, are confined to the command areas of major irrigation projects. The result is that there is a cluster of sugar factories in Western Maharashtra, with the largest number in Ahmadnagar district followed closely by Kolhapur. Satara, Solapur, Nashik and Pune share almost equally the distribution of sugar factories. The distribution can be arranged in 5 belts : the Panchganga basin, the Nira canal command area, the Mutha right bank command area, the Pravara-Mula command area and the Gangapur command area. In each of these regions, with the exception of Kolhapur, canal irrigation is available. Kolhapur-Sangli area gets the benefit of lift irrigation from Panchganga and Krishna. The growth of the industry is coupled with co-operative movement which received all the financial support from the Government. This explains why most sugar factories in the State are run by co-operative societies. Dominated by politicians and the local landlords, the regional politics revolves around these sugar factories. Elections to the Boards of Directors are very keenly watched and contested, since the control of a sugar factory means control of a rich enterprise without being its owner that is capable of financing many political and social activities. Out of a total production of 6.5 million tonnes of sugar, about 1.2 million tonnes is contributed by the State of Maharashtra. A fall out of the sugar industry in the State is the production of industrial alcohol.

The sugar factories form the nucleus around which a green patch develops. Plenty of canal water, cultivation of cash crops, use of modern implements, sizable agricultural inputs and improved agricultural practices are witnessed in these oasis-like areas in the midst of a dry and famished region.

Other industries.—Some more industries, both manufacturing and processing, are located in Maharashtra because of their unique locational requirement. Ship-building at Mazagaon dock in Bombay, and oil refineries in Trombay, or salt manufacturing along the coast are such industries. There are a few public sector enterprises like Ammunition factory at Ambarnath, refineries at Trombay and the proposed large fertilizer complex, and gas-based generators at Uran.

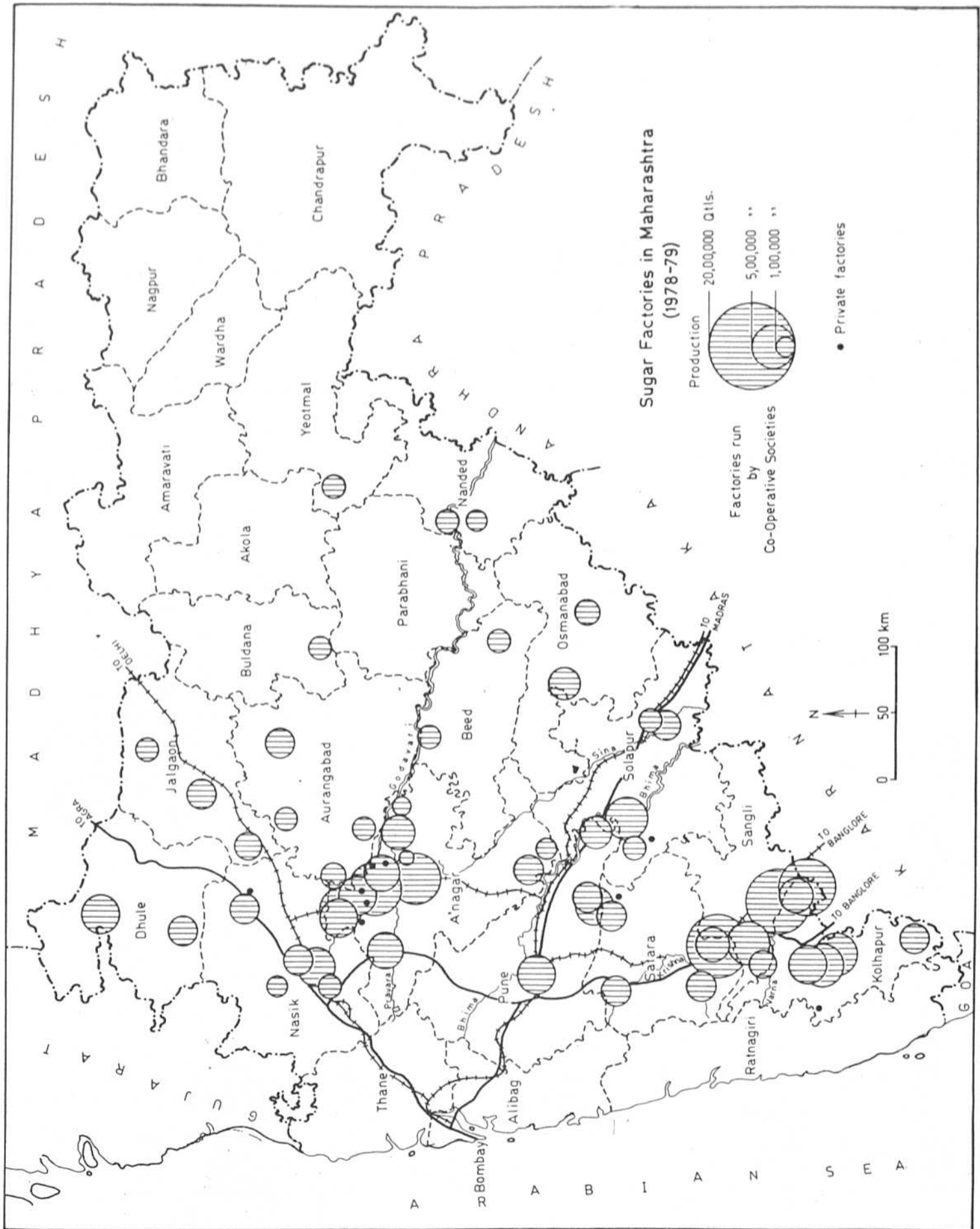
Food products, paper and paper products, rubber and plastics, beverages and tobacco, and non-metallic mineral products are the other leading groups of industries in Maharashtra.

Fig. 29



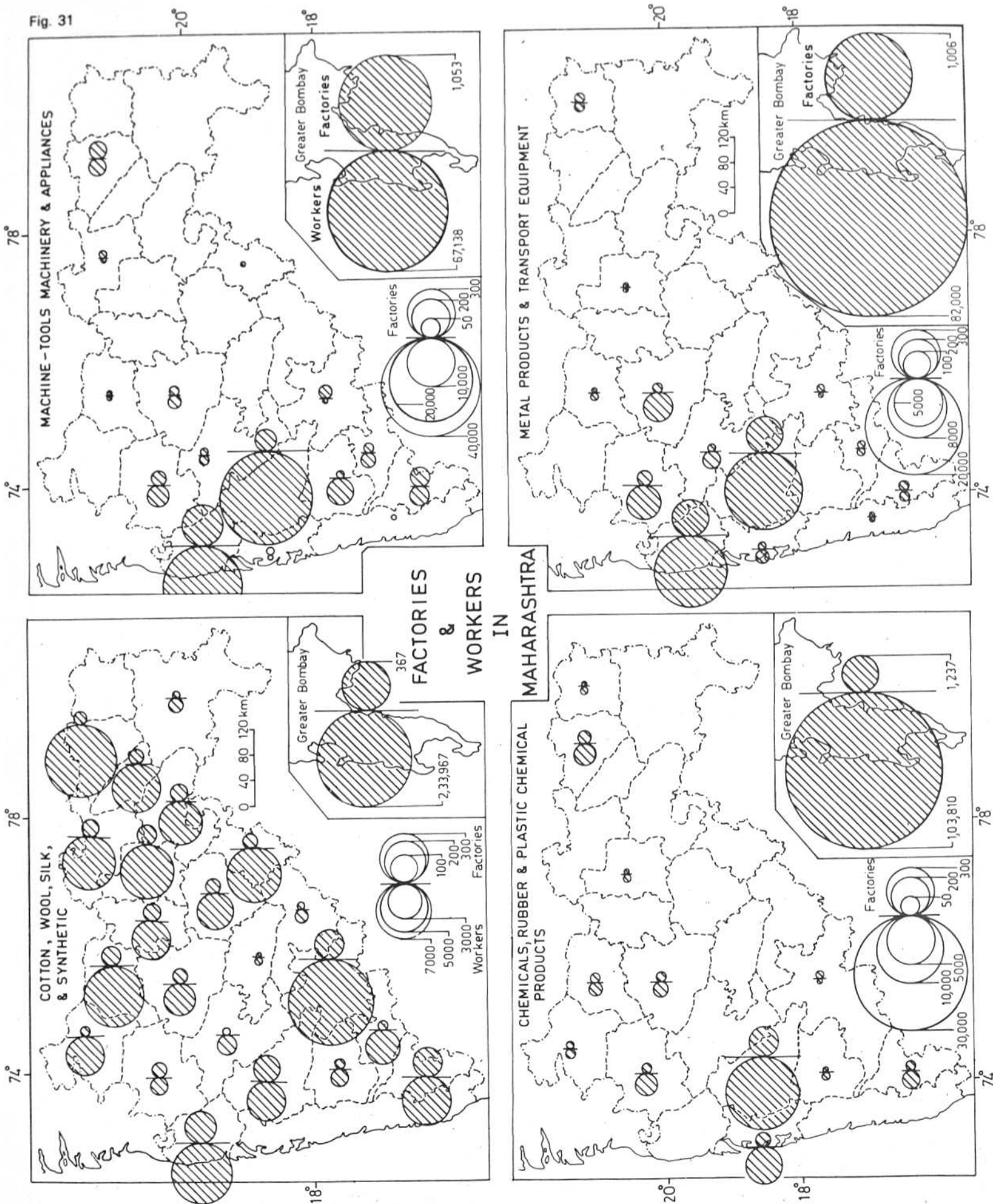
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 30



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 31



Industrial prospects.—The trend today is of growing concentration of industries in Maharashtra. In case of many industries the State stands first. The following table gives a relative picture of Maharashtra *vis-a-vis* India in respect of a few industries :—

T-12.2 *Share of Different Groups of Industries in the Total Industrial Production of the State*

Industry group			Maharashtra's share of total output (percentage of India)	Rank
1. Food products	..	..	19.20	1
2. Cotton Textiles	..	..	27.15	1
3. Machinery and machine tools	..	..	28.91	1
4. Metal products	..	..	40.28	1
5. Electrical machinery and goods	..	..	23.93	1
6. Chemicals and chemical products	..	..	39.54	1

To encourage the growth of medium and small-scale industries the Government of Maharashtra has set up a corporation known as Maharashtra Industrial Development Corporation. The corporation has developed a number of industrial areas and industrial estates with all the infrastructural facilities. These provide suitable sites to small-scale manufacturing and processing units set up by young entrepreneurs. The corporation has so far developed sixty industrial areas and over 650 industrial estates. There are more than 12,000 sheds allotted in the industrial estates to working industrial units. While the initiative taken by the Government and MIDC have certainly helped the growth of medium and small-scale industries, their efforts to promote dispersal of industries has not borne fruits. What really does not appear in line with the Government's avowed policy of dispersal is the concentration of industrial areas in the vicinity of the already developed industrial centres. A case can very well be made and the location of industrial areas justified, viability being the main consideration. But this only shows that MIDC has been only reinforcing concentration and the objective of decentralization and dispersal of industries is not achieved.

□ □

CHAPTER XIII

TRANSPORT AND TRADE IN MAHARASHTRA

An efficient system of transport is a pre-requisite to the development of a country or part of it not only because it promotes contact of diverse cultures but also because it is instrumental in the diffusion of innovations and brings the resources of a region within easy reach of capital and enterprise. In fact, accessibility is an important attribute of economic development, and more so in modern times. The State has a relatively good network of transport which includes the railways, the roads, the waterways and the airways. But certain areas have, for long, suffered from a general neglect and relative isolation, being remotely situated from the principal arteries of transport.

The Traditional routes and systems of Communication

Before the coming of the railways, development of automobiles and the ushering in of an industrial era with the concurrent development of large urban centres, the inter-regional dependence and mobility were limited, long distance haul was slow and hazardous and the rivers, mountains and forests presented formidable barriers. All over the country, there were certain well established routes which were relatively secure and protected by royal decrees. The Grand Trunk Road running from Peshawar to Dacca was one such route that was laid out and maintained by the Muslim kings. The routes between North India and the Deccan peninsula were also fixed. Routes, followed by the invading armies, caravans of camels or other pack animals and even pilgrims were well established and followed routinely. The established historical routes are active even today providing the alignment for National highways.

The main route from the North traversed the Malwa plateau crossed the Vindhya through Burhanpur gap, and fording across the Tapi ascended the Maharashtra plateau following the Dhule-Malegaon or Jalgaon-Aurangabad route. From Delhi, following the Aravali axis joining Jaipur, Ajmer, Udaipur and Ahmedabad, running parallel to the Arabian Sea coast was another well established route. Inside Maharashtra, Aurangabad-Solapur-Bijapur, Aurangabad-Ahmadnagar-Pune, Bijapur-Karad-Chiplun-Guhagar and Nagpur-Adilabad-Hyderabad were strategically the most important routes. The Nashik-Kolhapur route, now replaced by the national highways (No. 4 and 50), running in the shadow of the Sahyadrian range, was avoided for reasons of its being very vulnerable to attack from the hill tops. During the Maratha regime, these roads were maintained by 'Pachpandes', located at specific distances and repaired after the monsoons. These routes assumed added importance in the late 17th and 18th century when the conflict between the regional powers like Adilshahi of Bijapur, Nizamshahi of Ahmadnagar and the Marathas on the one hand, and the Moghul kings of Delhi on the other, sharpened.

Besides these strategic routes, there were some long established routes followed by the pilgrims. This is clearly seen in an unusually high degree of nodality that a religious place like Pandharpur commands. Significantly, more than two-thirds of the routes from Pandharpur radiate westward to collect the pilgrims from the Marathi speaking area where the cult of Vithoba is deep-rooted. Pandharpur-Phaltan-Bhor-Mahad-Shrivardhan, Pandharpur-Pune (following the present national highway-9), Pandharpur-Satara, Pandharpur-Karad, Pandharpur-Miraj-Kolhapur-Ratnagiri, Pandharpur-Ahmadnagar and Pandharpur-Barshi-Latur-Nanded were traditional religious routes which have retained their importance even today.

Most of these medieval routes either linked the capital cities of one or the other of the ruling dynasties, or led to places of pilgrimage like Pandharpur and Nashik. The area being resolved into small principalities, river valleys did not enjoy the importance they normally should have. It is paradoxical that no large town, with the exception of Nashik and Sangli, the former being very ancient, is located on an important river. The dry climate of the plateau and the uncertain navigability rendered them redundant as effective waterways. And since no dynasty controlled a large enough area to include a long stretch of the rivers, their valleys were not made use of for laying roads. North of Bhima, the routes are aligned north-south, whereas to the south of this river, the routes have assumed an east-west alignment. The north-south disposition is witnessed even in Tapi valley where small cords descend and join the Surat-Dhule-Nagpur national highway.

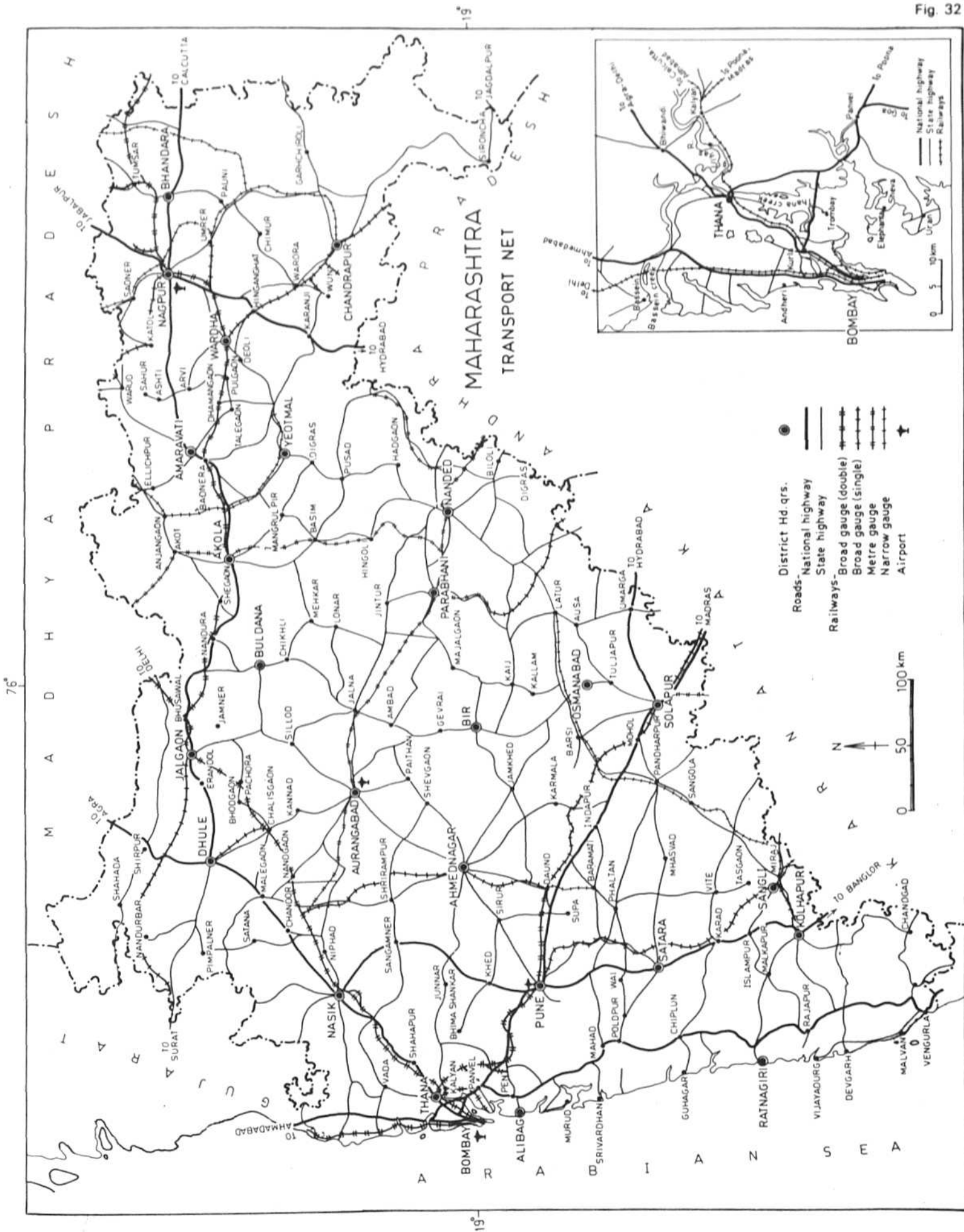


Fig 32

Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The Road network

The State has a length of 135,000 km of roads of which a little over half is unsurfaced. In absolute terms, this mileage is next only to Uttar Pradesh and West Bengal. For every one thousand sq. km of the territory of the State, it has 420 km of road which works out to 257 km for every lac of its population. This compares well with the average for the country, though not comparable to the density of network in several States. To quote a few examples, West Bengal has 1576, Uttar Pradesh 585, Punjab 797, Kerala 2249, Tamilnadu 846 and Karnatak 524 km of road for every 1000 sq. km of their territories. The network is neither uniform in quality nor in status. The roads are classified according to their importance by the authorities that maintain them. The categorywise distribution of roads in Maharashtra is as follows:—

T-13.1 *Road Length in Maharashtra*

Class of highways		Length of roads in Km in the State in March 1983
1. National highways	..	2,950
2. State highways	..	19,409
3. Major district roads	..	25,779
4. Other district roads	..	26,021
5. Village roads	..	28,884
6. Unclassified roads	..	42,452
	Total ..	<u>145,495</u>

Of the total mileage of roads only a little over 1/3 is surfaced, and the remaining stretches need to be strengthened and streamlined by getting them asphalted. In terms of areal distribution, the south-western part of the State which includes Sangli, Satara, Solapur, Pune and Ahmadnagar are well connected with a criss-cross pattern of roads. In contrast, the districts of Marathwada, and worse still those of Vidarbha, have a poorer road net, the length of roads nowhere exceeding 400 km per 1000 sq. km of area, and in some cases like Chandrapur even less than 20 km per 1000 sq. km of areal extent. What is really paradoxical is the percentage of surfaced road which is much higher in Marathwada than in Western Maharashtra and Vidarbha. In fact, if one takes into account the length of only the State highways which are invariably surfaced, Marathwada presents a comparably brighter picture, and the regional contrasts narrow down to a level which cannot be easily distinguished. To quote an example, Beed district, with the minimum total road length for a district in the State, has a larger share of State highways than either Sangli or Kolhapur, and surprisingly, the two districts of Chandrapur (998 km) and Aurangabad (990 km) have the highest mileage of State highways in Maharashtra. This reflects the phenomenon of inadequate local initiative. The district administration has been relatively inactive in some cases, for reasons of the paucity of resources, in opening and maintaining new roads. All districts with a better net have a larger share of their roads laid out and maintained by Zilla Parishads.

National Highways.—There are only a few districts in Maharashtra which are not traversed by National highways. These include Aurangabad, Beed, Nanded, Parbhani and Chandrapur, though a few other like Kolhapur and Sangli are either marginally touched by one or the other of the National highways, or traversed by them along a cord or the shorter axis of the district. The nine National highways traversing the State are as follows:—

T-13.2 *National Highways and their Lengths in Maharashtra*

Route	Name	Length in km in the State
1. National Highway No. 3	.. Bombay-Agra Road	.. 388
2. National Highway No. 4	.. Bombay-Pune-Bangalore Road	.. 384
3. National Highway No. 6	.. Surat-Dhule-Nagpur Road	.. 671
4. National Highway No. 7	.. Jabalpur-Nagpur-Adilabad-Hyderabad Road	.. 231
5. National Highway No. 8	.. Bombay-Ahmedabad Road	.. 121
6. National Highway No. 9	.. Pune-Solapur-Hyderabad Road	.. 327
7. National Highway No. 13	.. Solapur-Bijapur Road	.. 27
8. National Highway No. 17	.. Bombay-Konkan-Goa Road	.. 460
9. National Highway No. 50	.. Pune-Nashik Road	.. 190

Of these the highways radiating from Bombay have the maximum traffic density. The National highway-four, starting from Bombay and passing through Pune, Kolhapur right upto Bangalore is overcrowded. This highway is the lifeline of the industrial development in the area, particularly because of the incapacity of metre gauge railway line running between Miraj and Bangalore requiring trans-shipment of the goods originating from Bombay and thus entailing not only delay but even the risk of damage. The industries at Pune, Kolhapur, Belgaum, Hubli and further south depend more on road transport than on railway shipment. In fact, the National highway-four suffers from excessive traffic which creates its own friction. Another national highway almost equally congested is the national highway-eight. Radiating from Bombay and passing through Surat and Ahmedabad, it serves the industrial region of Gujarat. Though this road has a complementary broad gauge Western Railway that is straight and efficient, many small industries have moved away from the railway line and located themselves along the highway, to avail themselves of the quick road transport facilities. Bombay-Konkan-Goa is another highway that is important for Konkan districts in the absence of a railway line. In fact, it is the main artery of transport for the entire west coast between Bombay and Mangalore.

State and District highways

In Maharashtra, the State and district highways provide the basic pattern for internal circulation. The railway net in the State is rather poor and the intrastate traffic, particularly the passenger traffic, depends almost exclusively on the State Transport buses which ply on these roads. The intervillage transport in the Deccan country has been traditionally effected by what is known as the Deccan cart, a light bullock cart drawn by a pair of oxen. Many of these bullock cart tracks have acquired permanence and are maintained by Zilla Parishads. Some of these roads are macadamized and made all weather roads, good enough for motorized vehicular traffic.

Road Transport.—Road transport is far more important in Maharashtra not only because of the absence of a widespread railway net but also because of the need of quick goods transport for industries. Except for long distance haul for the distribution of imported industrial raw materials, capital goods and other consumer goods from Bombay to distant industrial locations and markets in the country, much of the goods transport requiring speed is handled by road transport. In fact, some of the transport arteries, particularly the national highways are overburdened and require frequent surfacing. Trucking is the commonest mode of transport where speed is the prime consideration. The Bombay-Bangalore and the Bombay-Ahmedabad routes are, in fact, congested with vehicular traffic particularly heavy trucks which are usually overloaded and rush with a menacing speed, often ignoring all normal traffic rules. To the remote areas of the State, not on the main railway route, a direct link with Bombay or other regional centres is provided only by road.

The passenger traffic in the State is carried by the railways, in conjunction with the buses operated by Maharashtra State Transport Corporation. While the railway provide the principal mode of transport for the commuters in Greater Bombay and Pune and the long distance travel to places in Eastern and South Maharashtra, the State Transport buses have been able to provide inter-city and inter-regional connections all over the State.

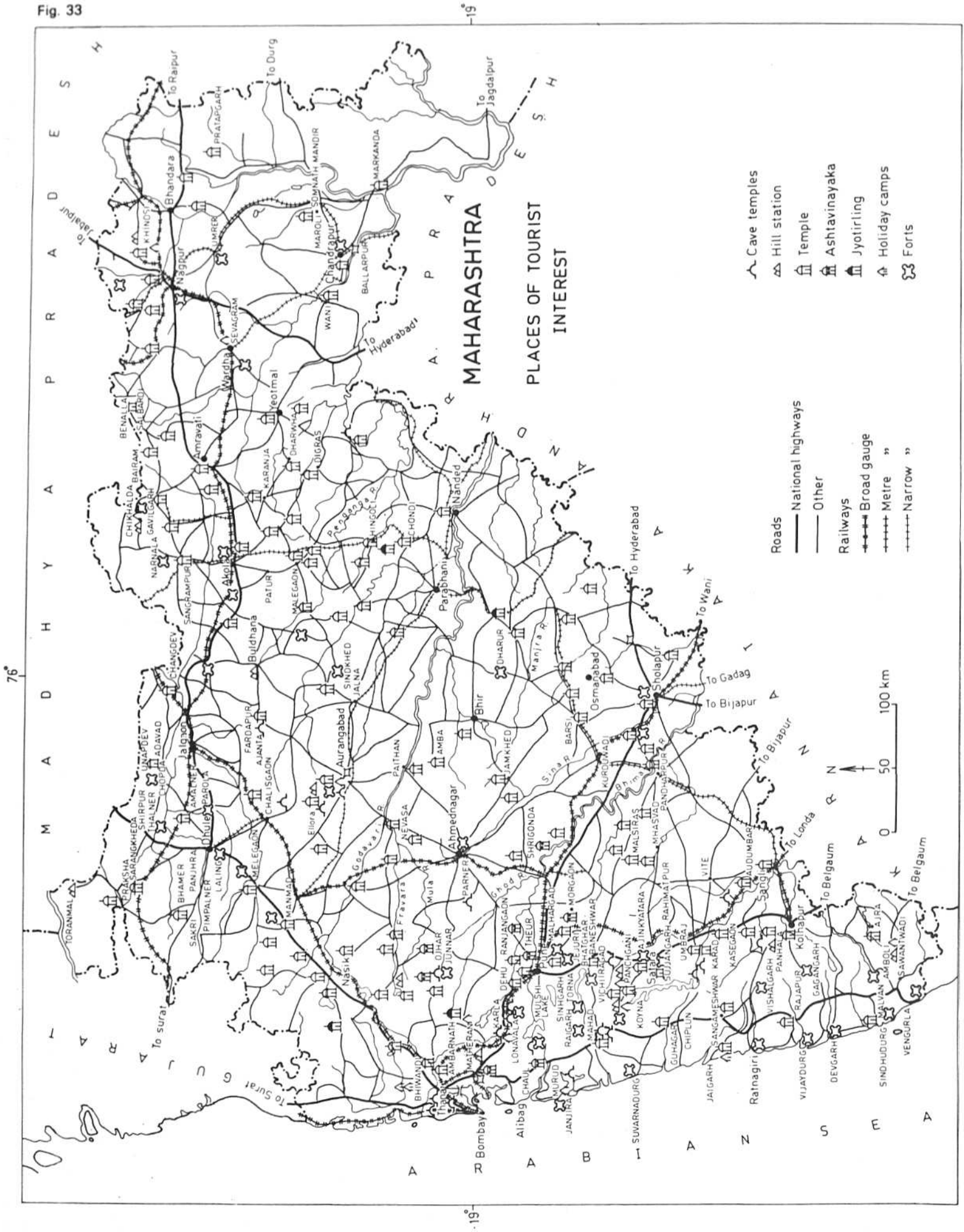
The State Road Transport Corporation and Passenger Traffic

The State Road Transport Corporation of Maharashtra, its perpetual inadequacy of the fleet of buses notwithstanding, has been the only transport organization in the State handling road passenger traffic. Leaving aside a few transport agencies in Vidarbha, the fleet of taxis that operate between Bombay and Pune, Bombay and Surat, and Bombay and Nashik, and individual transport contractors who effect group transport on contract, almost the entire passenger traffic of the State is handled by the Corporation, which is popularly known among the people as ST. There is not a single motorable route on which the ST buses do not ply. With a fleet of about 8000 buses, the ST buses carry three million passengers every day. A summary of the operational details of the Corporation brings out some significant facts—

T-13.3 *State Transport Routes and Distances travelled*

Divisions	No. of routes on (31-3-1980)	Total route distance in km. (31-3-1980)	No. of vehicles in 1979-80	Average number of daily passengers (in lakhs) 1979-80
Aurangabad ..	1,513	112,092	1,314	5.1
Bombay ..	3,416	190,910	2,785	10.55
Nagpur ..	1,885	118,666	1,914	5.5
Pune ..	2,841	188,846	2,470	8.81
Total ..	9,655	610,514	7,325	29.96

Fig. 33



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The Maharashtra State Road Transport Corporation is a successor to the Bombay State Road Transport Corporation established in December 1948. The Corporation started with a fleet of 36 buses operating on Pune-Ahmadnagar and the adjacent routes. Today, the Corporation runs passenger transport services on practically all routes. There are some nodes around which the areas are much better served than elsewhere. Pune, Ahmadnagar, Kolhapur, Thane, Nashik, Akola and Nagpur, are such nodes. "The Bombay-Thane road has the highest density of bus-traffic as Thane is the gateway to Bombay from the peninsular side." The frequency of the buses thins out telescopically as one moves to the hinterland from the principal transport nodes. Next to Thane-Bombay, Pune-Nagpur is the most frequented route, where, on an average, every 15 minutes there is a bus. The district of Chandrapur and some other parts of Marathwada suffer from a high level of inaccessibility. Besides the intra-state movement, the ST buses operate on inter-State routes connecting the capitals of adjacent States. Thus, Panjim, Bangalore, Hyderabad, Jabalpur, Indore, Ahmedabad all these towns are connected by State Transport buses. Operating usually from the border towns, the inter-State bus services are organized under a mutual agreement with the bordering States.

The State Transport buses have brought a virtual revolution in the mobility of the people of Maharashtra. Without realizing the impact, people have started travelling longer distances. To them a ST bus is far more dependable than a train. The traditional bullock cart as a means of transport is on its way out. People from even the remotest areas now find it easier to visit the towns either for shopping or in search of jobs, or migrate to large urban centres because of the availability of road transport on their door step. For important congregations, religious fairs, and holiday seasons, the ST presses into service extra buses. The ST buses are the most sought after means of transport on the plateau of Maharashtra during the summer months when most weddings take place.

Such a large network of transport service is also riddled with problems, not the least of which is overcrowding, frequent break-downs, serious accidents, and to top it all the none-too-polite attitude of the staff. But the scale on which these services are run and the control and regulation that are affected, only evoke admiration. The Corporation buses in Maharashtra have become an integral part of the village life.

These buses not only transport passengers but even goods of moderate bulk. On hilly routes the ST buses stop frequently to pick up agricultural workers, both in the morning as well as in the evening. In many cases students and other workers residing singly in the cities depend on ST buses for daily transport of their lunch packets from the parents. The daily supplies of milk and vegetables, from the surrounding countryside to the towns, depend largely on ST buses, particularly where the dairy co-operatives have not developed. In fact, ST has assumed some degree of synonymy with transport in Maharashtra. One of the advantages of this government-run service is the ability of ST buses to tread into even a very inhospitable terrain on the unsurfaced roads full of slush and deep grooves, which are even water logged in heavy rains. This certainly tells on the longevity of the buses but the social benefits that accrue to the remotest parts of the State to justify running even uneconomic transport services.

Railways

The State has over 5,000 km of rail length, spread all over, with the exception of Ratnagiri and Sindhudurg districts which are untouched by the railways. As it appears, railways were never laid in Maharashtra with a view to serve the peasantry or to improve circulation. Radiating from Bombay, most of the trunk routes like Bombay-Ahmedabad, Bombay-Calcutta (*via* Allahabad and *via* Nagpur), Bombay-Madras, Bombay-Bangalore passed through different parts of the State. A few other railways like Godavari valley railway passing through Aurangabad, Nanded and Hyderabad, and the Tapi valley railway from Jalgaon to Surat, served only as regional links. The Godavari valley railway, passing through the Nizam territory, formed an integrating link, whereas the Tapi valley railway brought the cotton producing area of Central India in contact with the textile towns of Surat and Ahmedabad.

The central and even the eastern part of Maharashtra, with the exception of Buldhana and Yavatmal, have a better network of rail transport than the hilly western part, where apart from the trunk routes, no links or cord lines are laid. The terrain configuration has a restrictive role and makes the laying of railway lines prohibitive. Along the Western Ghats and in the dissected zone to the immediate east, steep gradients, numerous deep valleys and wide ravines present barriers and necessitate not only the building of a large number of bridges, but also laying of circuitous roads. Thus, from the Arabian Sea Coast to well over 80 km east of the Sahyadri ranges, there are no north-south railway lines. As the topography becomes even with rolling plains, further east, north-south railway links start appearing.

The Dhond-Ahmadnagar-Manmad link, Latur-Barsi-Kurduvadi-Pandharpur-Miraj link, Solapur-Bijapur link, Akola-Hingoli-Purna link, are all beyond the shadow of the Sahyadris. The only north-south railway line running parallel to the Sahyadri is the Pune-Bangalore line following the Krishna valley, and occupying a relatively flat terrain beyond Sangli further south.

The railway net carries an unmistakable imprint on the industrial landscape of the State. Industries have preferred locations that are well linked with different parts of the country, a linkage with different parts of the State is only secondary. The Bombay-Nashik, Bombay-Pune and Kolhapur and Nagpur clusters of industries are all tethered to railway lines. Most large towns are located on the main railway routes since they provide easy access to different parts of the country. Route-oriented urban and industrial development, particularly along the railway lines, is nowhere seen better than in Maharashtra.

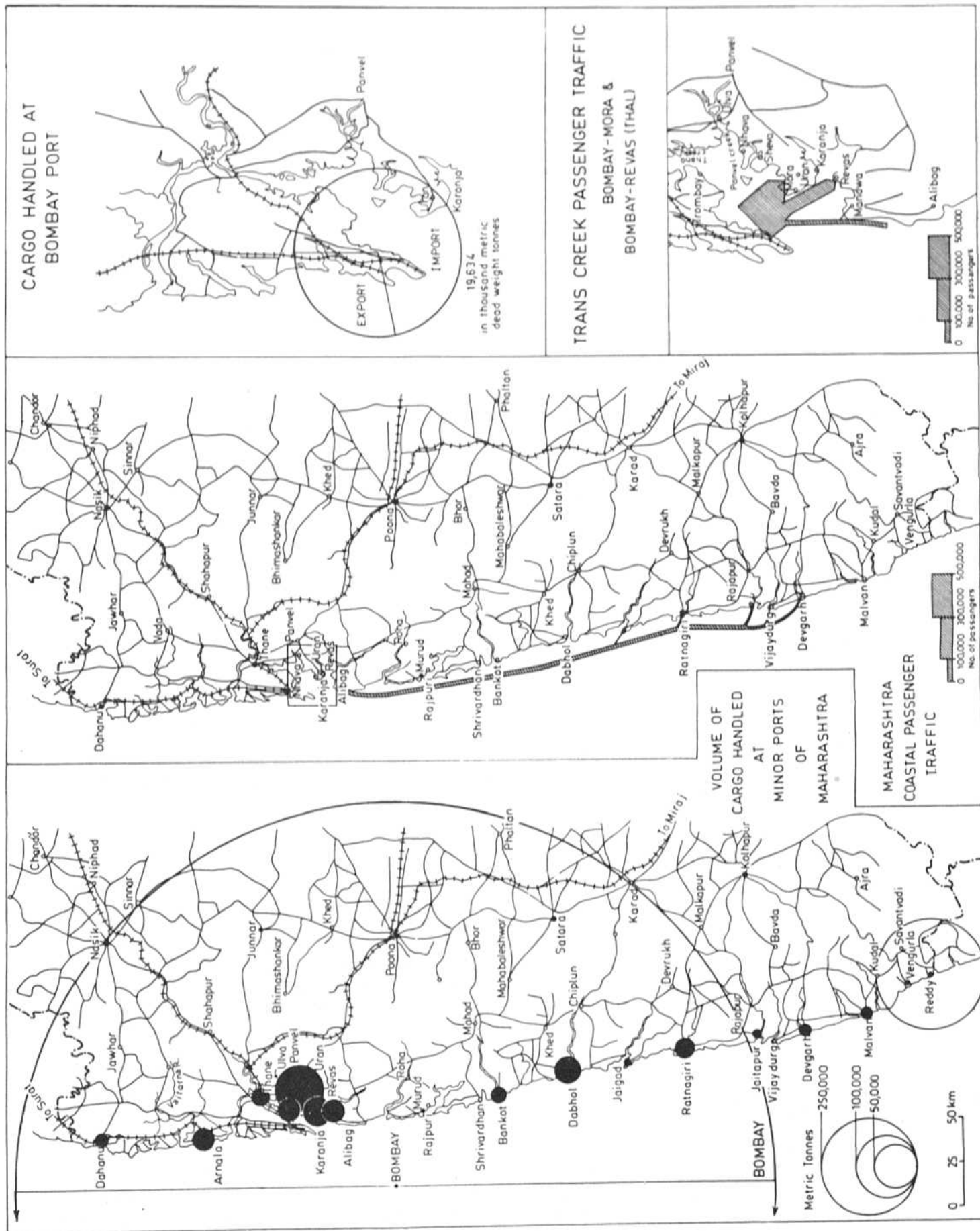
There are certain areas of the State where the railways have not made an impact. The Konkan coast even today is accessible only by road and the proposed Konkan railway is still a far cry. The sea-resources, the recreational avenues, and even the land and mineral resources of the region have not been adequately developed in the absence of a quick means of mass transport. And this, in spite of the fact that Konkan contributes the largest share of manpower to the work-force of Bombay. Poor agricultural land, as a result of the vast laterite cover, emphasizes the need to develop other resources like minerals and sea-resources and promote industries like tourism. But, all this requires very effective link with Bombay and the rest of the country. The single road that links Ratnagiri with Bombay gets frequently blocked during the rainy season as a result of landslides, or gets submerged under water and breached, as it happened during the severe flood of July 1983, isolating the region. The region has a good chance of being industrialized once the railways enter the scene. Although there is no apparent advantage like the availability of specific raw materials, the cheap and enterprising labour of the area will definitely attract foot-loose industries, like electronics, garments, dyestuffs and heavy chemicals etc. The entire coastal province, on the west coast of India, requires an effective transport and the laying of the coastal railway line will not only induce the development of the region and effective utilization of its resources but will also bring this important coastal region in the main stream of the country's economic life.

Terrain conditions pose the main problems in laying the railway line. Deeply entrenched valleys, hill ranges and the wide estuaries of some of the principal rivers necessitate building of too many bridges, making the cost of laying the railway line exorbitant. There are no mineral resources to be explored that will justify the laying of the railway line in purely economic terms, but the social benefits of the project will be tremendous and the development potential of the region will be realized sooner than would otherwise be possible—

T-13.4 *The length of railways in different districts of the State*

		(Km)			
Sr. No.	District	Broad-gauge	Meter-gauge	Narrow-gauge	Total
1	Greater Bombay	..	94	..	94
2	Thane	..	249	..	249
3	Kolaba	..	67	..	88
4	Ratnagiri	..	..	..	..
5	Nashik	..	214	44	258
6	Dhule	..	166	..	166
7	Jalgaon	..	327	..	381
8	Ahmadnagar	..	197	..	197
9	Pune	..	260	..	304
10	Satara	..	122	..	122
11	Sangli	..	..	87	169
12	Solapur	..	224	42	450
13	Kolhapur	..	41	..	41
14	Aurangabad	..	..	173	173
15	Parbhani	..	..	284	284
16	Beed	..	42	6	48
17	Nanded	..	..	227	227
18	Osmanabad	..	73	..	134
19	Buldhana	..	86	..	86
20	Akola	..	92	171	323
21	Amravati	..	88	33	184
22	Yavatmal	..	14	..	81
23	Wardha	..	114	..	149
24	Nagpur	..	215	..	354
25	Bhandara	..	155	..	288
26	Chandrapur	..	153	..	312

Fig. 34



The factual statement in the above table may prove misleading if the length of the railway line is taken as a sole measure of transport efficiency. The effectiveness of the transport does not always or exclusively depend on the length of the railways. In Maharashtra, districts like Parbhani, Solapur, Nagpur, Bhandara and Chandrapur show an inflated length which results from a none-too-efficient metre gauge railway line cutting across the region in case of Parbhani and Nanded, and the narrow gauge track laid to collect mineral ores in case of Bhandara and Chandrapur districts.

Certain areas in the State need attention on a priority basis, either for laying a new railway or for converting the existing metre or narrow gauges into broad gauge. As discussed earlier, there is need to lay the Konkan railways. Slightly less important, but economically very vital are the railway links to be established between Pune-Nashik and Pune-Ahmadnagar-Aurangabad. In fact, a sub-Sahyadrian railway could be laid from Dhule to Pune passing through Malegaon and Nashik. The metre gauge links in the absence of inter-regional connections have only a limited value, and could prove far more useful if these were converted into broad gauge. The Latur-Kurduwadi-Pandharpur and Miraj narrow gauge needs to be not only broadened but extended to join the Bombay-Nagpur Central railway.

Transport, particularly rail transport, has a significant role to play in the development of a region by providing access to the local resources, facilitating trade, encouraging inter-regional contracts and migrations, and by inducing the flow of ideas to the regions away from the large urban centres. The willingness to change, a key factor in development, is induced among the village folks as a result of their exposure to the benefits of modern technology. The improvement of transport, but more specifically the laying of broad gauge railway in Marathwada and Konkan, should be the first step in the development of these regions. The present narrow gauge railway operates in an isolated way having limited capacity and requiring trans-shipment at several points. In fact, all parts of the State and all district headquarters should be linked by direct rail routes from Bombay. Inadequate attention to the less developed areas could in no small a measure be attributed to the absence of a fast and direct railway link with Bombay, and laying of railway will be a definite triggering device to promote development.

Water Transport

In Maharashtra water transport is confined to the coastal areas of the State where sailing vessels and mechanized country crafts carry some passengers and goods besides the periodic passenger liners operating between Bombay and Goa. In the pre-automobile age, coastal shipping along the Arabian Sea Coast was quite important, since land transport was slow and tedious. The transport and distribution of goods in the coastal areas were effected by sailing vessels along the coast, and then moving inland along the creeks to the farthest navigable point upstream along a river, from where overland transport was undertaken to reach the producers or consumers. It is a well known fact that in the last quarter of the 19th century, a visit to Mahabaleshwar from Bombay required coastal sailing to Bankot on the estuary of the river Savitri, and then up the river to Mahad from where Mahabaleshwar was reached by horse drawn carriages. The coastal navigation had also brought into prominence a number of river ports like Kalyan, Mahad, Chiplun and Sangameshwar, besides the seaports like Dabhol, Jaigad, Vijaydurg, Devgad, Malvan and Vengurla.

Even today, the coastal shipping handles some cargo moved from Bombay to minor coastal ports. From Dahanu in the north to Redi in the south, there are twenty minor ports which handle a few thousand tonnes of goods every year. The ports of Thane, Panvel and Alibag (Dharamtar) located on creeks in the vicinity of Bombay, and the estuarine ports of Bankot on Savitri and Dabhol on Vashisti further south, are relatively more important than the rest of the minor ports. Jaigarh on the estuary of Shastri suffers from the proximity to Ratnagiri. These estuarine ports are also important fishing ports.

The only minor port that attracts attention is 'Redi', almost on the border of Goa. It is noted for the export of manganese mined in the vicinity. If Bombay is left out of account, about 80 per cent of the total bulk of trade, handled by minor ports, is handled by Redi alone. The total cargo handled by coastal shipping amounts to 1.5 million metric tons of which 1.4 million tons are included in export, and hardly a hundred thousand tons of goods are imported through these minor ports. Coastal navigation is more effectively used for carrying passengers, more often trans-creek passengers as between Bombay and Revas (Thal) or to coastal places away from the Konkan highway. The Bombay harbour ferry services carry more than a million passengers every year, and the State owned passenger liner operates between Bombay and Goa during dry months.

River transport is virtually absent in Maharashtra. Only a small stretches of the major rivers are navigable.

Trade

Though primarily an agricultural region, the State of Maharashtra produces many commodities in which it trades with other States of the country, in addition to contributing towards the international trade by exporting raw materials and manufactured goods. Being a leading industrial State and the foremost producer of sugar in the country, it exports both the agricultural as well as industrial goods. The position of the State, as of the entire country was, however, quite different a century ago. It was essentially an exporter of raw materials particularly cotton, oil seed, timber and manganese. The export of manufactured goods was out of question and the country was a net importer of goods and an overseas market for the industries of United Kingdom.

The internal trade of the State was organized—as it exists even today—at different levels with widely varying scales of operation. The village grocer, an ubiquitous phenomenon in Maharashtra, was both a supplier of non-agricultural goods as well as a creditor. He worked as a link between a market place and the village. The location of market places was so patterned as to command some centrality in the area and get the necessary threshold of population to provide the minimum clientele. These market places and the village grocers still exist though their number has increased and the goods and services they provide have widely changed. Today, the village shopkeeper sells a variety of goods like grain, textiles, salt, oil, soap, spices, stationery goods, cheap cosmetics, tobacco, animal feed, fertilizer and kerosene. The market places, usually the large villages, make available higher priced goods like agricultural implements, jewellery, diesel fuel and improved seeds, besides having a medical store and offering a host of services like a medical dispensary or a doctor, a veterinary surgeon, a shoe-maker, a barber and in some cases even a bank. Most of these market places were, for long, recognized as important grain markets, since grain was the major produce that the farmers sell and these centres served as collection centres.

In between the market centres usually coinciding with taluka headquarters and the village shopkeepers are the weekly markets held in large villages, usually with a population of over 2000. These places are located at some important railway stations or occupy nodal points on the intersection of several routes or simply on some National or State highway.

The weekly markets or the ones being held twice a week, started as a measure of strategy to collect grains or other agricultural produce from the farmers than for the sale of consumer goods. Instead of the individual farmers taking their produce to the nearest market-centre with one or two purchasers which virtually amounted to a monopoly purchase, and the inadequacy of agricultural-produce-stock for the bulk purchasers, a weekly meet of the buyers and the purchasers turned out to be a more convenient and effective way of bringing the bulk buyers and sellers together, eliminating the element of uncertainty and cutting down at the same time the frequency of visits that a farmer was required to make to the nearest market centre. In due course, the weekly market changed the nature of its transactions and did not remain only a place of bulk exchange or sale of agricultural produce but also a retail centre of distribution of non-agricultural goods. Weekly markets thus provide the basic elements in the hierarchy of trade organizations linked upward with local and regional market centres which in turn have links with the metropolitan cities.

The inter-State trade of the State includes many commodities. The export to other States includes cotton textiles manganese ores, sugar, kerosene and manufactured goods like machinery, automobiles, electrical goods, glass, pharmaceutical products and fertilizers. Maharashtra is a major producer of manganese which finds its way to the steel plants located in other parts of the country. The surplus of the two agricultural produce, cotton and sugar, is distributed to other States. Besides, the industrial goods produced at Bombay, Pune and Kolhapur are in demand all over the country. The State imports a variety of industrial raw materials, fuel oil and foodgrains. On balance it is more an exporter of finished goods and importer of raw materials from different parts of the country.

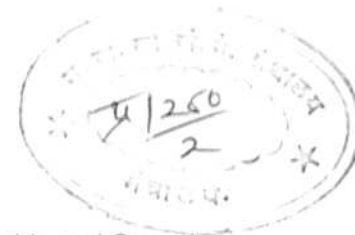
CHAPTER XIV

THE PEOPLE OF MAHARASHTRA

It is not only difficult but even unfair to characterise any part of India or the country as a whole, as the land inhabited by a specific ethnic stock. The positioning of Maharashtra in the transitional zone of India's two major linguistic provinces, the Indo-Aryan and Dravidian, ensures that the State shares the ethnic elements of both the groups. In fact, nowhere in India such a diversity of ethnic elements are observed as in Maharashtra. The hills and the forests in the eastern, northern and western borders of the State are occupied by tribal population. The rest of the population of the State shows diverse nasal and cephalic indices, shades of complexion and markedly different statures. In terms of religious composition, a majority of the population of the State consists of Hindus who are the earliest settlers of the State, next only to the tribal population. The Parsis, a very small religious group, their population not exceeding 100,000, and confined to the cities, came to India in the eighth century from Iran, and remained largely confined to the west coast. The Muslims entered this part of the country in the thirteenth century and their arrival coincided with the fall of the Yadav dynasty of Deogiri. From the beginning of the fourteenth till the beginning of the eighteenth century, Islam was spread not only by the Sultans and the Moghul emperors of Delhi but also by the rulers of the Bahmani dynasty. Needless to say that a significant part of the Hindu population adopted Islam either under duress or was induced to do so for material gains. Some even embraced Islam out of fear and in the hope of enjoying protection from the Muslim kings. The advent of Europeans on the west coast coupled with the missionary activities of different orders witnessed the propagation of Christianity and the rise of Christian population resulting primarily from the conversion of the caste Hindus. Large cities like Goa, Bombay and Pune were the focal points of ecclesiastical activities, a fact that explains the concentration of Christian population in the western part of the State. The charitable work of the Christian missions in underdeveloped areas attracted a large number of followers.

Except the Parsis, who are an endogamous small group and have preserved some degree of purity, the rest of the humanity has undergone a 'melting pot' effect, and it is difficult to trace the ethnic origin of a group of people. Even among the Parsis, some of the early migrants took Indian wives, often of tribal origin, and propagated a stock which is easily distinguishable from the rest. One can also find in the villages and towns of Maharashtra, people with highly negroid features including thick lips, broad nose and frizzy hair, stocky and dark looking. The Arab sailors on the west coast, the 'Habshi' slaves employed by the Moghuls and later even by Marathas, and the 'Habshi' estate of Murud-Janjira now in Raigad district which employed a good number of Africans, all cumulatively accounted for the sprinkling of Negroid traits among individuals of all castes including the Brahmins in Western Maharashtra. The Mongloid element is equally noticeable particularly among the Prabhus who are reported to have migrated from the foot hills of the Himalayas and among the higher caste Hindus, particularly the Brahmins.

Who are the people of Maharashtra ethnically, is a question which cannot be answered with certainty. The people speak 'Marathi', an Indo-Aryan language, and to that extent there should be a dominance of Aryan element in the population. But it is equally true that some of their customs and rituals are of Dravidian origin. One may even say that the Aryan dominance could penetrate as far as Maharashtra, and the regional culture and language, whatever their pre-Aryan shade, were completely enveloped by the Aryan culture adopting their language and social modes. It is equally probable that a couple of millenia earlier, this region was very thinly populated by a tribal group, different from the Dravidian people and subsequently absorbed the Aryan rather than Dravidian influence. The process may have been accelerated by Aryan colonization of the Deccan through military campaigns like those of Samudra Gupta, the spread of Buddhism and Pali and the annexation of this part of the country in the Ashokan empire. Though the social organization of the Rigvedic people, finally developing into the caste system, spread over the entire country, the Dravidian languages grew uninterrupted, may be, even benefiting from Sanskrit, and developed their own literature. Thus, as the speakers of the Indo-Aryan languages moved southward, either for colonisation or for military campaigns, they steadily transformed the cultural landscape bringing in its wake a Hindu society with its caste system, its culture, language and above all a feudal structure. The native element, the origin of which is difficult to trace may have



consisted of the tribal people who are presently found in the fastness of the Sahyadris and Satpuda mountains and the Jungles of Eastern Maharashtra. Other religions, like Zoroastrianism, Islam and Christianity, made their own contribution in producing a multi-religious and multi-lingual society. While the influence of Zoroastrianism remained confined to a very small area in Surat-Bombay-Pune region, and the Parsis as a religious group tried to preserve the purity of the indigenous stock by remaining an endogamous group, the Islam and Christianity followed the policy of conversion. The Muslims and the Christians of the State, as much as of the entire country, while ethnically belonging to the same stock as the Hindus, follow different religions and have adopted a life style conforming to their faiths. During a period of several hundred years, since the fall of Deogiri, the capital of the Yadav Kings, to the Sultans of Delhi, till the early eighteenth century, the frequent military campaigns of Delhi Kings led to the conversion of a large number of people either to escape persecution or to gain some favours from them. This also led to the emergence of the pockets of Muslim population like Osmanabad, Bhivandi and Malegaon, besides a general sprinkling of Muslim population in the State.

Besides the native stock which is an amalgum of the Aryan, Dravidian and Pre-Dravidian elements, the coastal population of Maharashtra regardless of the caste carries the imprint of negroid element and the traces are not wanting even on the plateau. The erstwhile Murud-Janjira Princely State was ruled for sometime by a Habshi king and the progenies of the negrito stock from the native women have added to the number of Habshis in the region. The slave labour imported into Goa by the Portuguese, finally found a place for themselves and multiplied not only in the territory of Goa, but even migrated southward to Karnatak. It may appear strange, if not paradoxical, that even 'Chitpavan Brahmins' which occupy the pride of a place in the intellectual life of the state, carry negroid strain—more semitic than negroid—in their hair texture, nasal index and even the alignment of lips. Not a few Chitpavan Brahmins have thick lips, a slightly frizzy hair and a broad nose, though a dark colour is rare. The negroid element penetrates even on the upland and can be easily identified, and not too easily disposed off casually. Thus, being a state in transitional zone, between the Indo-Aryan and Dravidian speaking people, surrounded by a tribal belt, and exposed to the influences from overseas particularly Africa and Middle East, Maharashtra has absorbed the ethnic elements of diverse origin.

In terms of religious composition, the people of Maharashtra can be grouped as follows:—

T-14.1 *Religious Composition of the Population of the State*

Religion group	No. of people (1971)	Percentage of People
1. Hindus	4,13,07,287	81.94
2. Muslims	42,33,023	8.40
3. Christians	7,17,174	1.42
4. Sikhs	1,01,762	0.20
5. Buddhists	32,64,223	6.48
6. Jains	7,03,664	1.04
7. Others	80,023	0.16
8. Religion not stated	5,079	0.01

Hindus, the pivot of the society.—The Hindus, no doubt, form the pivot of the society. And, though six per cent of the population is classed as Buddhists, usually known as Neobuddhists, to distinguish them from the original followers of Buddhism, they are akin to Hindus in their social organisation and moral codes. Almost the entire population of Buddhists is the follower of late Babasaheb Ambedkar, a political leader and a social reformer, who led them to embrace Buddhism.

The Hindu society in Maharashtra, as anywhere else, is riddled with internal groups and factions; but, the most institutionalized grouping is their division among many castes. The major castes of Maharashtra include Marathas, Brahmins, Kayasthas, Kunbis and many occupational castes which have labelled themselves as Marathas. Among the scheduled castes, Mahars, Chambhars and Mangs are important. The number of castes, though numerically not important, is a legion.

Marathas.—A peasant caste, known for its martial quality, 'first heard of in the thirteenth or fourteenth century, it came into prominence as a fighting race in the seventeenth century with the rise of Shivaji (1627-1680), and nearly became masters of India in the eighteenth'. The leaders among the Marathas rank as Kshatriyas, but the majority of the members of this community came from shepherds and cultivator class. They are grouped as—

- (1) Maratha proper
- (2) Maratha Kunbis, cultivators also called Kulvadis
- (3) Maratha allied castes

The Marathas proper claim equality, descent and kinship with the Kshatriyas, and follow the rules enjoined by Manu for the 'twice born'. The Marathas proper are recognized by a legendary 'ninety-six' groups called 'Kul', though there are controversies about these ninety-six 'Kuls'. Though an endogamous group, endogamy is narrowed down to sub-castes. Such Marathas as had marital relations with ruling Maratha families during the Maratha period, or even subsequently when they were reduced to vessels of the British, adopted a different epithet and are known as 'Khandani Marathas'. This distinction is based solely on the power and prestige enjoyed by certain families and did not depend on genealogy or ancestry. It is the first of these categories which claims nobility and descent from some traditionally respectable families.

Maratha Kunbis are considered lower in social the hierarchy than the Maratha proper. These correspond to 'Kurmi Thakurs' of north India and take pride in giving their daughters to Marathas in marriage.

Maratha occupational castes are many. In fact, any caste in Maharashtra which does not fall in the category of the erstwhile untouchables calls itself a Maratha. The occupational castes claim a status higher than the untouchables, and their occupations more respectable, but since they are not fully absorbed by the Maratha community, they add with their occupational name the suffix Maratha, like Lohar Maratha, Teli Maratha, Mali Maratha etc. While the surnames among the Marathas establish genealogical link, it is an irony that the most respectable Maratha surnames are discovered even among the scheduled castes. Over the decades, many of the scheduled caste people have adopted the surnames of their masters whom they served. Respectable Maratha surnames like More, Kadam and Gaekwad are found even among the scheduled caste people. An interesting feature of the Maratha caste is the adoption of a 'Devak' or marriage guardian. Though a 'Devak' is not the object of reverence, almost all Marathas have it and sometimes clans having the same Devak do not intermarry. The idea of 'Devaks' is totemistic and has a tribal origin.

What is more relevant to the contemporary scene is the dominance of Marathas in the political life of the State. In a democratic set-up, the unquestioned numerical superiority of this caste has provided it with the leverage necessary to govern the State. While the rule of the majority is only fair, the alignment on the basis of caste shows the strength of age-old ties and the importance of caste, more specifically a dominant caste in the affairs of a state. It has the advantage of providing a stable Government but the risks of a policy making body drawn largely from the majority caste falling prey to a tribal instinct are equally serious and real.

Most Marathas are peasants, and together with Kunbis and Malis they own much of the agricultural land. They are sturdy farmers and have developed strong political lobbies in the State, based on sugar co-operatives. Being a land-owning caste, they are usually the village heads known 'Patils', a surname most frequent among the 'Marathas', though not one of the ninety-six Kuls. The dominance of Marathas in the State is not based on caste hierarchy, but derives its strength from the tradition of their having been the ruling families and the owner of Maratha Jagirs. During the reign of Shivaji, Marathas reached the height of their glory, and soon after sprang a number of ruling dynasties like Gaekwads of Baroda and Shindes of Gwalior, besides the seats of power of the descendants of Shivaji at Satara and Kolhapur. The Maratha rulers have been more enlightened and the Chhatrapati Shahu also known as Rajarshi Shahu of Kolhapur and Sayajirao of Baroda spearheaded expansion of education and social reforms much ahead of others. The name of Karmaveer Bhaurao Patil is well-known for his untiring zeal in taking modern education to the masses 'the Rayats' in the village.

The Brahmins.—Though numerically a small group, Brahmins have had a pre-eminent position in the affairs of the State right since the days of Shivaji. They were favoured and even protected during the reign of Shivaji and became all too important during the tenure of the Peshwas who were not only the hereditary prime ministers but the *de facto* rulers of the Maratha empire. With the advent of the British rule, they showed the necessary resilience to adjust to the changed situation, taking modern education, entering into the administration and other services and following white collar professions like engineers, doctors, teachers and lawyers. The community was always alienated from the soil, though the Brahmins held 'Inam' lands in many parts of the State and owned it as absentee landlords collecting rent from the tenants. With the introduction of the 'lands to the tiller' policy in the fifties, they were dispossessed of whatever land they owned and the Brahmin peasant has turned a rare phenomenon in Maharashtra, particularly in the western part. Over the decades, members of this community have migrated to the towns to pursue non-agricultural occupations.

During the last couple of centuries, Konkanastha Brahmins have migrated in increasing number to the upland. The pace of migration was accelerated during the Peshwa regime, and today, all major cities of Western Maharashtra have a significant population of Konkanastha Brahmins. During the freedom movement, the Brahmins of Maharashtra were in the forefront, and stalwarts like Tilak and Gokhale who spearheaded the movement in this part of the country and brought awakening among the masses by their writings, belonged to this community.

There is hardly any doubt that the Brahmins of Maharashtra are a migrant group from North India. Their minority character and the retention of affiliation of different Vedic Schools is an evidence of this fact. Over the centuries, changes in the observance of rituals or marriage customs have crept in. For instance some of the Brahmins have adopted cross cousin marriages, a practice not prevalent among the Brahmins of the north.

The intracommunity grouping among the Brahmins reflects the region of their colonization in the past or the history of their migration. The Konkanasthas and the Deshasthas, the two major groups are the original settlers of 'Konkan' and 'Desh'. Even among the Konkanastha Brahmins, sub-groups based on sub-regions can be identified, giving in the process groups like 'Chitpavans', 'Karadas' and 'Saraswats'. Among the Brahmins, the genealogy being not so disputed, the regional affiliations have become quite important. In the Gangetic plain, a parallel to Maharashtra can be seen in the grouping which distinguishes the 'Kanyakubj' Brahmins living in the Ganga-Yamuna doab from the 'Saryuparis' living in the plains of Saryu river.

The priestly character of the community is almost completely lost and the Brahmins besides being the intellectuals, political leaders, scholars and technicians, contributing greatly to the skilled manpower of the State, are no longer the custodian of tradition. They have moved with the time, adopted a modern outlook and are at times highly materialistic. It must, however, be admitted that the cultural development and the literary traditions of Maharashtra have been largely nurtured by the Brahmins who also established some reputed educational institutions in the last century and are still the pioneers in the field of art and culture.

The Kayasthas.—Another migrant group like the Brahmins is represented by Kayasthas, better known as 'Chandraseniya Kayastha Prabhu' or simply CKP. These are a counterpart of Kayasthas of north India and must have migrated to this part of the country quite early. Traditionally, the Kayasthas have been the court writers, and very good accountants and record-keepers. They wield considerable influence in the society. In the present day Maharashtra, they are an intellectual class and take up white-collar jobs and follow professions like teachers, doctors, lawyers and bankmen. Their number is small and they are largely confined to Bombay-Pune region.

The occupational castes.—A large array of castes practising different occupations call themselves Marathas. These are all Hindus, like a carpenter (Sutar), a smith (Lohar), a goldsmith (Sonar), an oilman (Teli), a gardener (Mali), a potter (Kumbhar) and many others of this category. Each one of these is a 'Jati' and an endogamous group, but members of the community loosely call themselves Marathas. Their number is large and they serve the rest of the community with their skill in a specific way. Many of these castes fall within the fold of 'Balutedari' system, a system of village functional organization in the bygone days that comprised twelve 'Balutedars' each doing a specific work for the village.

The depressed castes.—The present term is borrowed from the census of 1931 when it was used for the castes, contact with whom entailed purification on the part of high-caste Hindus. These castes had many deprivations and social disabilities. With the independence of the country, untouchability was abolished by law and all the castes were given equal status. The depressed castes, in order that they are helped, were listed in the Constitution of India, and are now generally referred to as scheduled castes. The depressed castes of Maharashtra are made of 4 principal sub-castes, the Mahars, the Chambhars, the Mangs and the Bhangis. Of these the last one seems to have come from North India during the last few centuries. And Mahars, Chambhars and Mangs are the principal constituents of the scheduled caste population of the State.

Of the scheduled castes, Mahars are the most numerous. They live in small hamlets or scattered huts close to a village and close to its entrance in case of a walled settlement. There are no ethnic indications of the Mahars or for that matter the other two depressed castes being different from the higher castes. They were the hereditary watchmen of the village and used to assist the Patils, the village chiefs, in their work. Carrying of dead cattle and skinning them was a job which was generally done by Mahars. The latter, in return for their services, were given 'Watan' usually a piece of land which they seldom cultivated and only got some return from it. A large number of Mahars have, during the last few decades, embraced Buddhism to be able to shed away the social disabilities they suffered because of their occupying the lowest rung in the caste hierarchy, following the lead given by Babasaheb Ambedkar, himself a Mahar, and a leader and social reformer.

Over the years, and particularly after independence, things have changed. An increasing number of scheduled caste people have taken to service and daily wage earning, and in the process, the community has contributed greatly to the unskilled work force of the cities. Though dispersed in all parts of the State, the depressed classes have their highest concentration in Marathwada, particularly in Osmanabad district. Among the depressed castes also, there is a social hierarchy. The Chambhars claim precedence over Mahars and are adept at leather work. Their occupation which is leather processing and shoe making is considered more respectful than the skinning of dead animals. Chambhars are not only socially superior but economically better off than the Mahars. Still lower in the hierarchy are the 'Mangs' who are rope and basket makers, and one of their sub-castes, called Mang Garudi practises the profession of snake charmers.

Scheduled castes in Maharashtra are politically very active and have a political party of their own, the Republican Party of India. Besides, they have a militant wing, 'The Dalit Panthers', who project their demands through agitations. They are heard more often in the political and social debates, and a group of Marathi writers advocating their cause has created 'Dalit Literature'. The condition of the scheduled caste people has steadily improved as a result of the facilities and reservations offered to them in all spheres of life.

The distribution of the depressed class population, more specifically the communities included in the group 'scheduled castes', is not uniform and certain areas have a concentration far in excess of the average, whereas certain others are virtually devoid of the scheduled caste population. Over twelve per cent of the population of Maharashtra consists of scheduled castes, about half of which has adopted Buddhism, thus reducing the percentage of scheduled castes to a bare six per cent. The elevation of half the scheduled caste population in Maharashtra to Buddhism has in no way lessened their grievances nor have they benefitted economically. But they are more militant than their Hindu brethren. In Maharashtra, the people who have embraced Buddhism belong to 'Mahar' caste and the endogamous nature of the caste is still preserved despite their adoption of Buddhism.

The coastal Maharashtra has a very small population of scheduled castes, their ratio varying between one and two per cent. In contrast, the dry region of Marathwada has a very high concentration, much above the State average. Osmanabad and Beed districts and some areas of Nanded district have a concentration almost thrice the State average. The Deglur taluka of Nanded district presents a unique case with a fifth of its population classed as scheduled caste. A very low percentage in Konkan and a very high concentration of scheduled castes in Marathwada, particularly Osmanabad, Beed and Solapur, and a close to average in the rest of the State suggests an infallible link with the type of economy, level of agricultural productivity and probably the administrative history of the region. Could it

be, that the depressed classes found life less harsh and the society less discriminating in the neighbouring Nizam ruled territory than in other parts of the State dominated by the Marathas and the Brahmins. A meagre population of scheduled castes reflects lack of opportunity as agricultural labour. The high concentration in Marathwada, Solapur and even Kolhapur region reflects greater demand for agricultural labour for picking of cotton and crushing sugarcane, both labour intensive agricultural operations. Being usually landless, in most parts of the State, the scheduled caste people work as agricultural labour.

Times have changed, caste stigma is fading out and the members of the so-called high castes no longer display the condescending attitude that they once had. The skinning of the cattle is no longer considered the exclusive occupation of scheduled castes. The economic compulsions have, no doubt, forced a majority of them to remain on the land as agricultural labour. The growth of industries has worked as inducement to the landless people or those holding small and uneconomic holdings, to migrate to the towns. Thus, about 4 per cent of the population of Bombay is composed of scheduled castes, suggesting a sizable migration of this community to urban areas or centres of industrial employment. Over the decades, and particularly after independence, the scheduled castes have always been looking for an opportunity to migrate to towns. The meagre holdings they inherited as 'Inam' land is uneconomic and is in virtual possession of peasant communities like the Marathas and Kunbis who cultivate the land and dole out a share to the absentee owners.

The status of the scheduled castes though changing imperceptibly has become a subject of controversy. With the facilities for education and self-development and reservation in jobs, they have gained much, though not without resentment on the part of other communities. The policy of protection through reservations extended indefinitely may not generate the necessary initiative in the group to survive in a competitive world. Unless exposed to some competition at some stage from the rival elements, this deprived section of the community may degenerate rather than develop and prosper.

The Aboriginal Tribes of Maharashtra

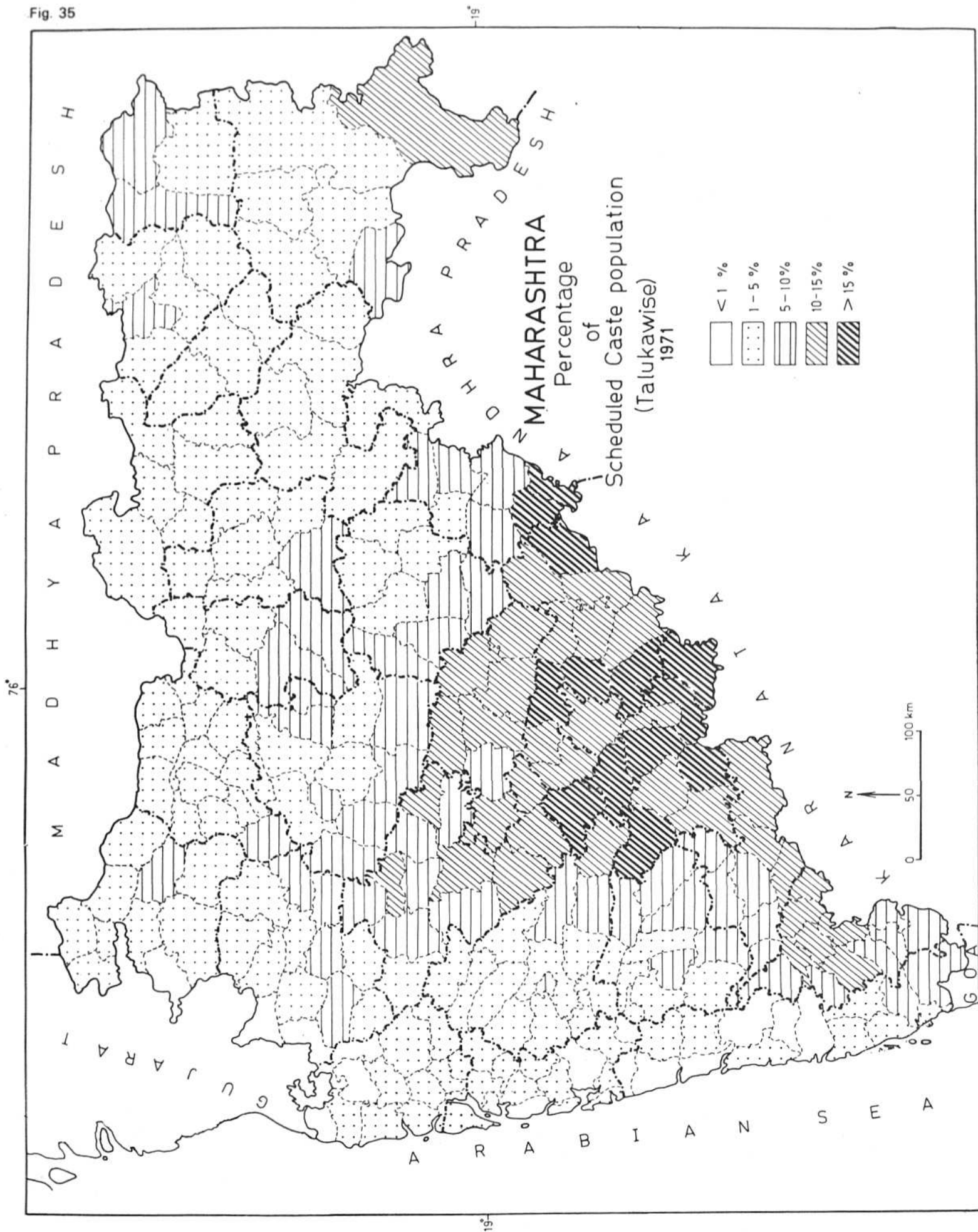
A little over five per cent of the population of Maharashtra consists of aboriginals who can be distinguished from the rest of the society by their totemistic beliefs, customs, the dialect they speak and above all absence of a firm adherence to any religion. No doubt, a large part of the tribal population, particularly in Maharashtra, has taken to Hinduism adopting in some cases their gods and rituals. This is particularly true of the tribals in the western part of the State including Thane, Nashik and Dhule districts.

Broadly speaking the tribal population of Maharashtra can be divided into five groups:—

- (1) *Gonds* with their numerous denominations in the East, inhabiting Chandrapur and Bhandara districts.
- (2) *Warlis, Katkaris, Kolis, Thakurs and Mahadeo Kolis*, all occupying parts of Thane, Raigad, Nashik, Pune and Ahmadnagar districts, in the Sahyadri hills.
- (3) *Bhils* of Northern Maharashtra, chiefly found in Satpudas, in Dhule and Jalgaon districts. Associated with the Bhils are two important tribal groups, the Gamits and the Koknas.
- (4) *Kurkus*.—The tribals in the Melghat region of Amravati district.
- (5) *Scattered tribal population*.—There are isolated pockets where there is a residual tribal population, as in the Kinwat taluka of Nanded district, where 'Andh', Gond and Kolam form the main tribes.

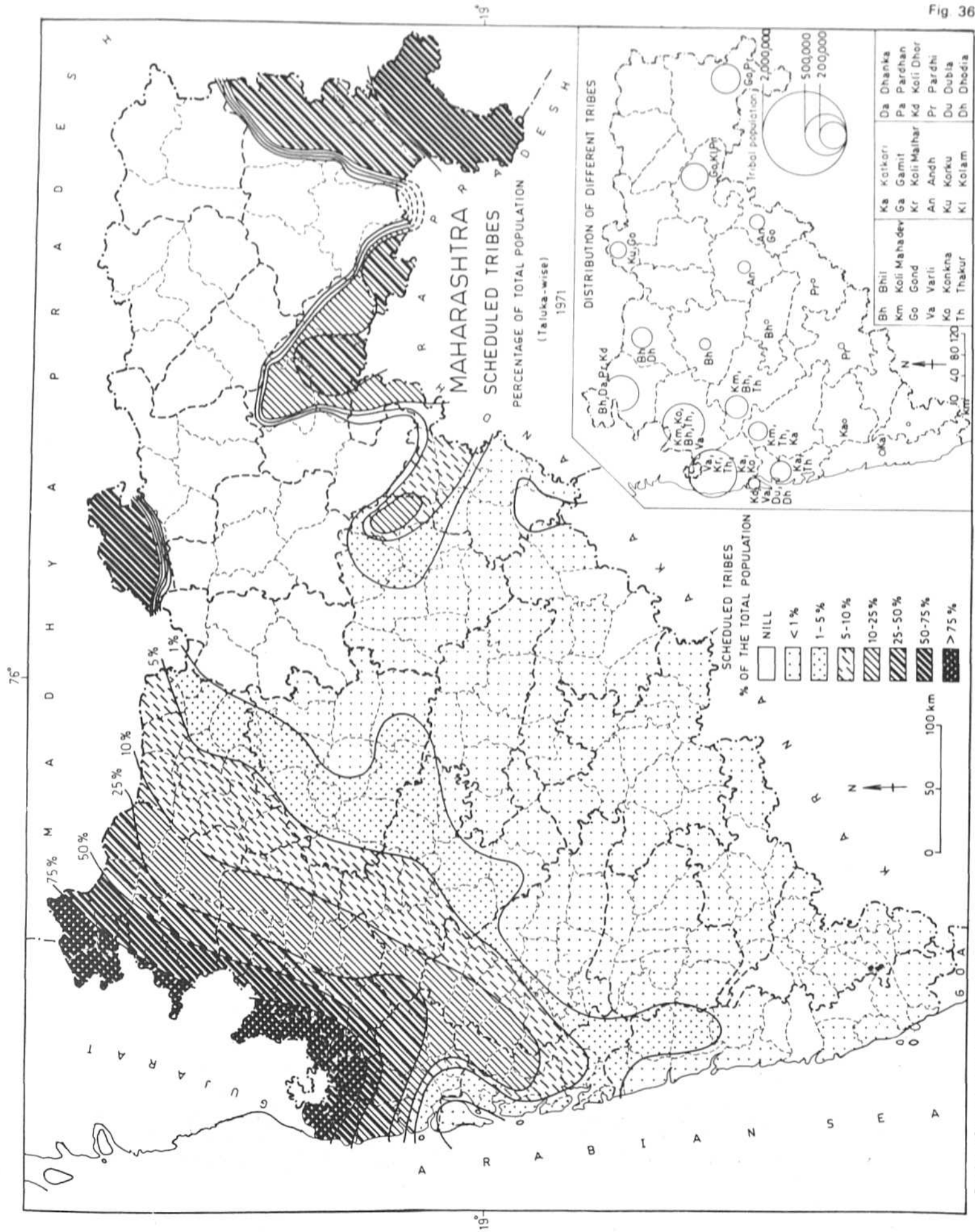
Distribution.—Numerically, Dhule district has the largest concentration of tribal population followed by Thane and Nashik. Both these districts together account for about 60 per cent of the tribal population of the State. The entire north-western belt of the State extending from the Satpudas over to Western Ghats teems with tribal population. In some areas, like the Akrani, Akkalkuwa and Nawapura talukas of Dhule, the land is almost exclusively populated by tribals with hardly 10 per cent of the population being non-tribal which consists of forest department employees, petty traders and contractors. A similar situation obtains in the neighbouring areas of Nashik and Thane districts extending down to the coast where the talukas straddled by Sahyadri ranges are largely inhabited by tribals. The Peint and Surgana talukas of Nashik district and Dahanu, Mokhada and Jawhar talukas in Thane district are areas with an excessive concentration of the aboriginal population.

Fig. 35



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig 36



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The appearance of a tribal belt in the north western part of the State that coincides with the forest clad ranges of Satpuda and the Western Ghats, suggests a process of squeezing out of the tribal population to the hilly tracts, left over after the colonization of much of the cultivable land by more enterprising groups. The more enterprising among the tribals who could take to cultivation were perhaps absorbed by the peasantry which largely followed Hinduism. This hilly tribal belt forms part of and is contiguous to a larger tribal belt that extends from the Aravallis in Rajasthan down to Panchmahals and Dangs in Gujarat, culminating into Satpura-Sahyadri belt. In fact, this is the Great Bhil belt, largely populated by the Bhils, the southern end of which is inhabited by Warlis, Kathkaris, Kolis and Koli Mahadevs. One of the basic questions that one may ask is whether these tribes together with many others like Koknas, Dublas, Gamits and Dodhias are independent tribal groups, or they are the sub-groups of a larger Bhil tribe. Some of these tribal groups have acquired a name after their occupation or the areas they occupy. Thus, Varlis and Koknas are the settlers of the upland and the Konkan coast. The term 'Varli', is interpreted variously, and one of the interpretations refers to 'Varal' a small patch of cultivated land and to the 'Varlis' being uplanders in contrast to Koknas. While the Kathkaris are named after their occupation, namely the collection and processing of 'Kath', the 'Thakurs' represent a section of the tribal community who came into contact with the Rajputs. Some of the Bhils also call themselves Bhil Thakurs.

The largest tribal group in north Western Maharashtra is formed by Bhils followed by Koli Mahadev, Gonds and Varlis.

T-14.2 *Population of some important tribes in Maharashtra—1971*

(1) Bhils	..	641,302	(6) Thakur	..	178,805
(2) Koli Mahadev	..	339,855	(7) Kathodi (Kathkaris)	..	146,785
(3) Gonds	..	312,060	(8) Gamit	..	128,831
(4) Varlis	..	293,931	(9) Koli Malhar	..	99,613
(5) Koknas	..	264,009			

The Bhils.—The Bhils, divided into two main groups, the 'Pawar Bhils' and the 'Barda Bhils' are concentrated in the hilly regions of Dhule, Nashik, Jalgaon and Ahmadnagar districts, and the bordering plains. They account for nearly a fourth of the tribal population of the State. Claiming an antiquity as ancient as Ramayan, the Bhils are not only important in Maharashtra but are the largest tribal group in the country. They speak local languages, but they have a Bhili dialect which resembles Gujarati or Rajasthani, suggesting a link with the core area, the area of maximum concentration which lies between Aravallis and the Satpudas. The Bhils are adept at the use of bows and arrows and fond of drinking. Though living as settled communities in the villages, agriculture is not their strong point. Not infrequently, they have been dispossessed of their land by crafty money lenders and landlords. By and large, they practise Hinduism and consider themselves cousins of Rajputs. A few have also changed to Islam and are known as 'Tadvi Bhils'. These, reportedly, are the progeny of the Muslim soldiers from Tribal women born during the Moghul campaigns of the Deccan.

The Gonds.—The Gonds and the Bhils are divided by a sharp north-south line and occupy exclusive provinces. While the Bhils are largely confined to Rajasthan, Gujarat and Maharashtra, Gonds are concentrated in Madhya Pradesh, eastern Maharashtra, and parts of Andhra Pradesh and Orissa. In fact, the heart of India, formerly known as Central Provinces, was occupied by 'Gonds' and their sub-groups. In Maharashtra, the Gonds are concentrated in Chandrapur, Yeotmal and Nanded and a small number even in Amravati district. Over ninety per cent of the tribal population of Chandrapur consists of Gonds and the remaining ten per cent is shared among Pradhans, Halbas and Kawars. Among the Gonds, there are some groups which still live in most inaccessible areas and are very backward. The Madias, also called the Maria Gonds, particularly those living in 'Bhamragadh' region of Chandrapur district, represent such a group. Speaking a dialect which is akin to the Dravidian languages, the tribe has a stronger affinity with the Dravidian culture. The occurrence of Gonds in the central part of India, apparently a result of their being pushed out from other parts of the country, could also be attributed to a milieu to which they readily adopted themselves.

The Gonds of Chandrapur and the adjacent territory were the rulers of a kingdom and continued for several centuries till they were subjugated by Akbar, the Moghul emperor, and some of them even embraced Islam. The towns of Ballar Shah and Chandrapur were founded by the Gond kings and the city wall and fortifications at Chandrapur bear testimony to the Gonds being once the rulers of a large territory. The Gonds are highly Hinduised and have adopted many of the customs and beliefs of the Hindus.

Korkus.—Inhabiting the Melghat region in Amravati district, the Korkus are a Mundari tribe and represent the westernmost extension of the Mundari people, the core area of whose occupation is Chota Nagpur. It could be that the northward movement of the Gonds drew a wedge, and the Korkus of Gawilgarh region were isolated from the rest of the Mundari tribe. They speak a Mundari language and have taken to settled cultivation in large numbers. The Melghat area being well forested, these people also work in the forests as labour, and occupy compact settlements with rows of houses. The tribe has adopted Hinduism on a large scale, without totally giving up their totemistic beliefs. It is divided into several totemistic exogenous groups. Numbering around 70,000 they have even spread to the plains at the foot of the Melghat hills.

The Scattered Tribal Groups.—Besides the main tribal groups stated above, there are pockets of tribal population in Yavatmal, Nanded, Parbhani and Aurangabad districts. While in Yavatmal, a district adjacent to Chandrapur, there is large population of Kolam, besides the Gonds, the 'Andhs' form the predominant tribal group in Parbhani and Nanded districts. Their occurrence in these districts bordering Andhra Pradesh is not isolated but forms a contiguous belt that extends right into Andhra Pradesh. Smaller tribal groups like 'Pardhis' in Solapur and Jalgaon districts, or 'Halba' in Chandrapur district are found scattered all over, and have virtually lost their tribal character. The Pardhis, though classed tribes, are, in fact, nomadic.

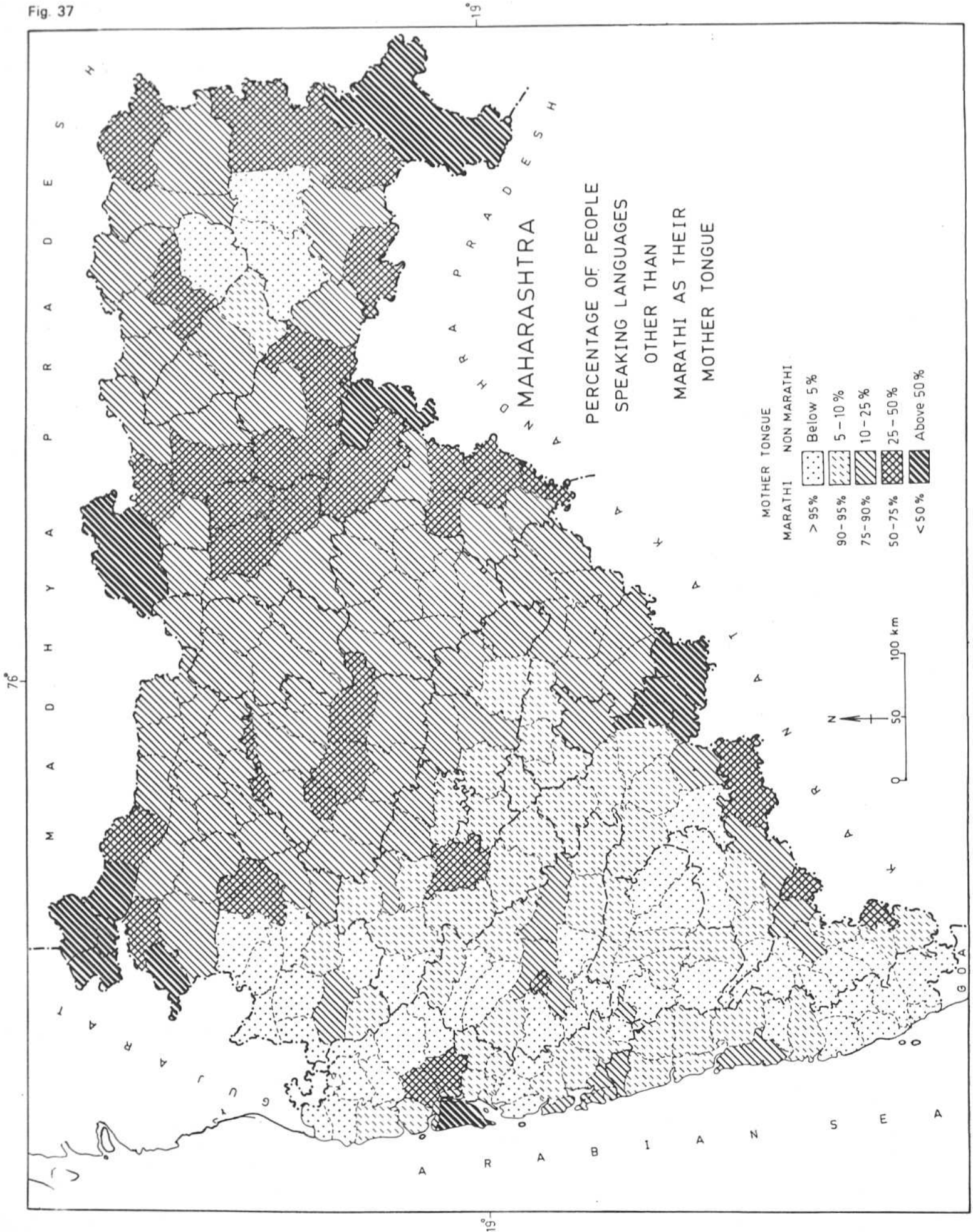
Nomadic Tribes.—There are about fifty nomadic tribes in Maharashtra, the most important of which is the 'Dhangar tribe', tending sheep and wandering from one part of the State to another. The largest concentration of Dhangars in the State is around Jejuri in Pune district in the area where an old shrine of 'Khandoba', the family deity of the Dhangars is located. The community consists of heterogeneous elements practising sheep grazing, but the real core of genuine Dhangars is still retained. A large number of Dhangars have taken to settled occupations like the weaving of woollen blankets and farming. A large segment, however, still practises transhumance moving their herds of sheep towards the Sahyadris after the monsoon period and returning to the drier parts of the plateau just before the arrival of the rains. The Dhangars speak Marathi and believe in 'Khandoba' an incarnation of Lord Shiva or 'Bahiroba', but the community also worships 'Vithoba' of Pandharpur and Mahadev of Udgir.

The Language of the People

In one sweep, one may observe that the language of the people in the State of Maharashtra is Marathi, since the State itself is organized on the basis of the homogeneity of language. This has, however, to be understood as the language of a majority of the population. In certain urban pockets and the peripheral areas of the State, languages other than Marathi are observed as being spoken by a large group of people. Most such areas are inhabited by tribal groups and are located on the borders of the State. The Sironcha taluka of Chandrapur, Akrani, Akkalkuwa, Sahada and Nawapur talukas of Dhule district, Kinwat taluka of Nanded district, and the Akkalkot taluka of Solapur district are the areas where languages other than Marathi are important. The tribal population of Chandrapur, Amravati and Dhule speaks Gondi, Korku and Bhili dialects. Metropolitan cities like Greater Bombay and some talukas of Solapur district stand on a different footing. In case of Bombay, the non-Marathi speaking component of the immigrant population is fairly large and shows in the linguistic composition of the city. The Indian Census (1961) returned Akkalkot as a dominantly Kannada speaking taluka, but its proximity to Solapur town and the age old administrative links justify its inclusion in Solapur district.

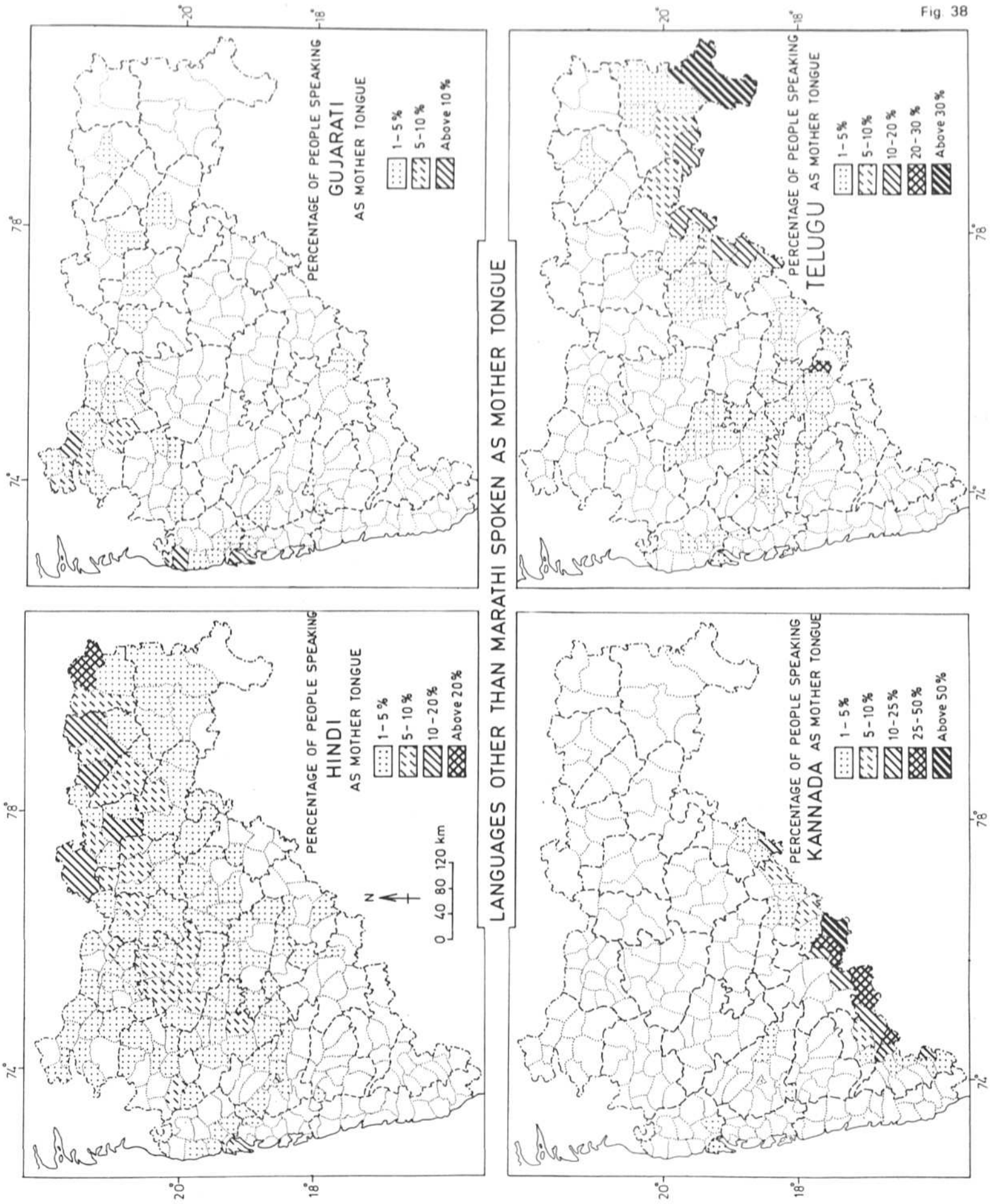
The Linguistic mosaic.—Hardly any pattern emerges out of the spatial distribution of languages, since Marathi envelopes the entire area; but if one looks at the distribution of people speaking languages other than Marathi as their mother tongue, a broad picture emerges that distinguishes Western Maharashtra from the rest of the State. Leaving aside the tribal areas and Greater Bombay, there is a negligible percentage of people having languages other than Marathi as their mother tongue. The districts of Nashik, Pune and Satara and the coastal belt consisting of Thane, Raigad and Ratnagiri districts form the core of the Marathi speaking area. As one moves eastward, there is a greater admixture of non-Marathi languages and the districts of Khandesh and Vidarbha, with the exception of a few tehsils of Nagpur and Chandrapur, show more than 10 per cent of their people speaking languages other than Marathi. In fact the river Godavari is the limit of unsullied Marathi. Just beyond Godavari to the north-east, the sprinkling of Hindi, Urdu, Telugu and Tribal languages increases. The cotton producing districts of Amravati, Akola and Wardha show a far greater influence of non-Marathi languages. The belt running from Melghat to the south-east, joining Andhra Pradesh, has over ¼ of the population speaking Hindi and Telugu.

Fig. 37



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 38



The long association of some parts of Maharashtra with the Hindi speaking Madhya Pradesh and the Nizam territory of Marathwada where the Muslims always pretended to be Urdu speaking, has not only led to a superimposition of other languages, but also to the injection of a considerable number of non-Marathi speaking people. This may appear hypothetical but it is quite possible that the movement of the Marathi speaking people from the core-area further south-east has transformed the linguistic composition of the peripheral areas, which were otherwise Kannada or Telugu speaking.

The four principal non-Marathi languages in the State

Next to Marathi, Hindi is by far the most important language spoken as mother tongue in many parts of the State. The ratio of Hindi speaking people increases towards the north-west, though seldom exceeding ten per cent. The northern parts of the districts like Amravati, Akola, Wardha, Nagpur and Bhandara have a fair sprinkling of Hindi speaking people. The entire Vidarbha region, forming part of the erstwhile Madhya Pradesh State, still carries the imprint of its having been a part of a Hindi speaking State. The southern parts of the districts of Chandrapur, Yavatmal and Nanded are influenced by their contact with the Telugu speaking districts of Andhra Pradesh. About ten per cent of the population of these border talukas speaks Telugu, though the level rises to over 25 per cent in the Sironcha taluka of Chandrapur district. A parallel situation exists on the Karnatak border of Solapur and Sangli districts, in which case some of the talukas have as much as one-fourth of their population speaking Kannada as its mother tongue.

□ □

CHAPTER XV

POPULATION

Maharashtra has a population of over 62 millions (62,693,898—1981) according to 1981 Census. This forms over 9 per cent of the total population of the country. During the current century the population of the State has increased more than three-fold—

T-15.1 *Population Variation (1901-1981) in Maharashtra*

Year	Population of Maharashtra	Decadal Variation	Percentage variation
1901	19,391,643		
1911	21,474,523	+ 2,032,830	+ 10.74
1921	20,849,666	— 624,857	— 2.91
1931	23,959,300	+ 3,109,634	+ 14.91
1941	26,832,758	+ 2,873,458	+ 11.99
1951	32,002,564	+ 5,169,896	+ 19.27
1961	39,553,718	+ 7,751,154	+ 23.60
1971	50,412,235	+ 10,858,517	+ 27.45
1981	62,693,898	+ 12,281,663	+ 24.54

In the demographic growth of the State, two distinct periods can be identified, one pre and another post second-world-war period. The growth rate from 1901 to 1941 lingered around 1 per cent per annum and sometimes showed even a decline, as in the second decade of the century. After 1941, there has been a progressive increase, from 1.9 per cent per annum for 1941-51 to 2.7 per cent per annum for 1961-71. Seventies were a period of family planning drive that paid off dividends and in 1981, a definite decline in the growth rate is noticed. The annual growth rate is brought down to less than 2.5 per cent from 2.7 per cent in the previous decade. The most significant fact is that the population of the State has more than tripled since the beginning of the century.

A decline in the population of the State during the decade ending 1921 seems to have resulted from the cumulative effect of the famine in the eighties of the last and the plague epidemic in the beginning of the present century. A very insignificant population growth or even a decline appears to have been a pervading common feature of the demography of almost all districts of Maharashtra in 1911. There are a few exceptions, particularly the erstwhile Nizam territory, now the Marathwada districts, which demonstrated a growth rate over 2.0 per cent even in 1911. This seems to have resulted from the absence of plague epidemic, but more likely, it was the result of under numeration in 1911, since not one district of Marathwada showed any increase in 1921. On the contrary, the entire Aurangabad division underwent a declining population trend. The upland districts of Western Maharashtra had either an indifferent growth rate or a decline in 1911, obviously the effect of plague, though migration to Bombay may have also neutralized the natural growth in this part. The Vidarbha districts were relatively secure from epidemic and famine, and showed normal growth even in 1911.

Following the first world war, the State suffered from the shortages of all kinds, the aftermaths of the war, and to beat it all, the influenza epidemic which took a heavy toll of life. There was a universal decrease in population. The population of the State as a whole fell by about a million. The worst sufferers were the districts frequently visited by drought, like Ahmadnagar, Bhir and Aurangabad. Each of these districts showed a negative growth of over 2.0 per cent in their population. The decline in population covered a much larger area though not so severely. From the twenties to the early fifties the State recorded a population growth varying between one and two per cent annually. Despite a high birth rate, an equally high death rate, and above all a high rate of infant mortality retarded the growth rate.

After the second world war, the growth trend of the population of the State, as also of India as a whole, assumed a quick upward trend, rising annually at a rate of about two per cent. This, as is normally believed, is caused by a decrease in death rate without there being a concurrent reduction in birth rate. As is clear from the above table, the history of demographic evolution and population planning presents only a dismal picture. There is no relief from the increasing pressure of population.

All parts of Maharashtra did not show a uniform increase or decrease in population. Even in 1951, Marathwada and Vidarbha seem to have suffered more from the 1943 famine than the western districts of the State where the impact of famine was minimal as the supplies from large urban areas were assured.

The spatial contrasts in the population growth observed during the last thirty years need to be emphasized. Broadly, the pattern that emerges could be generalized by grouping the areas into—

- (i) Bombay Metropolitan region including Thane district and Nagpur and Pune districts.
- (ii) Maharashtra plateau.
- (iii) Konkan [Kolaba (Raigad) and Ratnagiri].

Greater Bombay and Thane, both have always shown a higher growth rate than the rest of the State except in 1931, when Bombay city, following the unstable conditions after the Second World War and the epidemics, coupled with the economic recession remained virtually stagnant during 1921-1931 period. For the rest, it has always increased at a rate much faster than the mean growth rate for the State or even for India. The highest growth rate for this metropolis was during the decade 1941-1951 when it frog-leaped by about 66 per cent in 10 years. During the same period, Thane also increased its population by 45 per cent. In a space of 40 years (1941-1981) the population of Bombay has increased five-fold. The maximum increase in terms of absolute number has occurred during the last ten years, when 2.23 million people were added to the city. It is obvious that this unusual growth has resulted from the continuous rural-urban influx which injects lacs of people every year in this city region.

Other important urban centres like Pune and Nagpur have, by virtue of their growth, added to the overall growth of these districts. Pune and Nagpur have grown by over 30 per cent during the 1971-1981 decade. The phenomenon of metropolitan growth and an abnormal increase in the population of the districts with large urban centres are not isolated facts and have to be seen in the light of a corresponding decrease in the growth rate of the adjacent districts and other areas of out-migration.

The Konkan districts of Raigad and Ratnagiri present a contrast. The increase in these districts is far below the average for the State. Ratnagiri suffers from a depletion of its manpower in response to the urban pull from Bombay. The migration from Ratnagiri outweighs the migration from Raigad which is the adjacent district, a phenomenon explained only by the agricultural poverty of infertile lateritic area of Ratnagiri in contrast to the relative agricultural prosperity of Kolaba which binds the farmers to the soil. Kolaba being adjacent to Bombay, commuting has prevented a wholesale migration of the people to Bombay.

The plateau districts, on an average, show a 20 per cent decadal increase in population. Variations result from the fact of agricultural prosperity and the degree of out or in-migration. The areas suffering from frequent droughts, where poverty works as a push factor and induces migration, and the districts closer to Bombay and Pune which experience the pull of employment opportunities in industrial centres suffer equally from out-migration and record a lower population growth. Beed, Osmanabad and Buldana come in the former category and Satara, Solapur and Wardha in the latter. A comparison of the population growth rates for different districts of the State brings out the following facts.

The districts with large urban centres and an industrial base show a very high growth rate. Greater Bombay, Thane, Pune and Nagpur are such areas, each having more than 30 per cent decennial growth in their population. Thane is an extreme case which lying adjacent to Bombay, has not only absorbed the spill-over population and industries of Bombay but has offered logistically the most suitable sites for industries, workshops and residences, and thus represents a growth which owes itself to its contiguity to Bombay.

On the other end of the spectrum, are the districts which have suffered out-migration like Ratnagiri, as a result of urban pull, or the poorer districts of Marathwada, as a result of push factor, showing a poor growth. The districts with a sound agriculture base, better irrigation facilities and developed means of transport like the district of Khandesh show a normal growth varying between 20 and 25 per cent over the decade.

Distribution of population

Absence of uniformity in the distribution of population is seen in unequal density which varies from about 100 persons per sq. km. in the tribal belt of Thane and Nashik districts to 10,000 in Greater Bombay. The State, as a whole, has a density of 204 persons per sq. km. which is, in a way, representative of the country. It is almost insignificant as compared to the high density States like Kerala, West Bengal, Tamilnadu, U.P. and Bihar, but much higher than the low density States like Rajasthan, Assam, Andhra Pradesh and Gujarat. This moderate density of the State has to be seen in the light of a relatively high level of urbanization that the State enjoys, with over 12 per cent of the total population of the State living in Bombay. Thus leaving aside Rajasthan, M.P. and Orissa, Karnatak and Gujarat, Maharashtra is the least densely populated major state of the country.

The reason for this is not far to seek. The Plateau Maharashtra, with rocky surfaces and inadequate rainfall, never saw a very prosperous agriculture. Relying largely on monsoons which did not bring adequate rains, and frequented by occasional drought, the plateau was a scene of extensive agriculture, producing largely millets that could support only a small population.

Inside the State, there are wide variations from one part to the other. The density arrangement follows the following general principle.

(i) A high density is observed around the Metropolitan areas of Bombay and Pune. Thus, Thane, Raigad, Pune, Kolhapur, Nashik and Nagpur have a relatively high density of population. The urban agglomerations add a great deal to the total population, and despite a low density beyond the urban field, the overall density of the districts remains high.

(ii) Areas with a higher level of urbanization—In reality this means large market places and towns in the district. A high density of Satara and Kolhapur districts owes itself to the presence of towns like Karad and Kolhapur. The high density of Thane district is, in a large measure, affected by the population of Kalyan and Bhivandi.

(iii) Irrigated areas and areas with higher agricultural productivity have absorbed greater population. Shrirampur area of Ahmadnagar district, Baramati taluka in Pune district, Phaltan taluka in Satara district, Malshiras in Solapur district, Shirola in Sangli district and Hatkanangale, Shirol, Kagal and Gadhinglaj in Kolhapur, each with a density over 300 and occasionally 400 persons per sq. km., reflect a prosperous agricultural base. These are the areas which grow cash crops, including sugarcane, and have developed a number of industries, the most important being the sugar factories.

In contrast, the density of population is much lower in dissected, infertile and inaccessible areas. Mountainous land, forested areas and areas afflicted with frequent droughts and scarcity have fewer people. Often the areas inhabited by tribal population show low density. This, one may emphasize, is not because of a lower growth rate among the tribals; far from it, the growth rate of tribal population may be even higher than the rest of the population, but the tribals have been disadvantaged by the paucity of resources in the hilly forested areas and hence more widely scattered producing a low density. The Peint and Surgana talukas of Nashik each with a density of about 100 persons to the sq. km. Akrani and Sirpur talukas of Dhule district, Velhe and Mulshi talukas in Pune, Melghat taluka in Amravati and Sironcha and Gadchiroli talukas in Chandrapur district, all these are either mountainous or forest covered and support only thin tribal population.

The areas with low and uncertain rainfall and prone to drought have traditionally repelled population. In Ahmadnagar district, Jamkhed, Karjat, Parner and Shrigonda talukas are areas of frequent droughts, and there is a regular outflux of people from these areas to large urban and industrial centres. Similar situation exists in Mangalvedha and Karmala talukas of Solapur district. River valleys, particularly those of Krishna, Nira, Pravara, and Upper Godavari plains have a higher carrying capacity and attracted large population. In contrast, the dry plateaus in Central Maharashtra and more specifically the Marathwada districts with inferior soil support only a small population.

The Composition of Population

The composition of the State's population can be determined on the basis of demographic or cultural attributes. It could be based on religious faiths, educational achievement, sex, age, occupational structure or any other criterion. The religious composition of population, no longer in vogue, and

Fig. 39

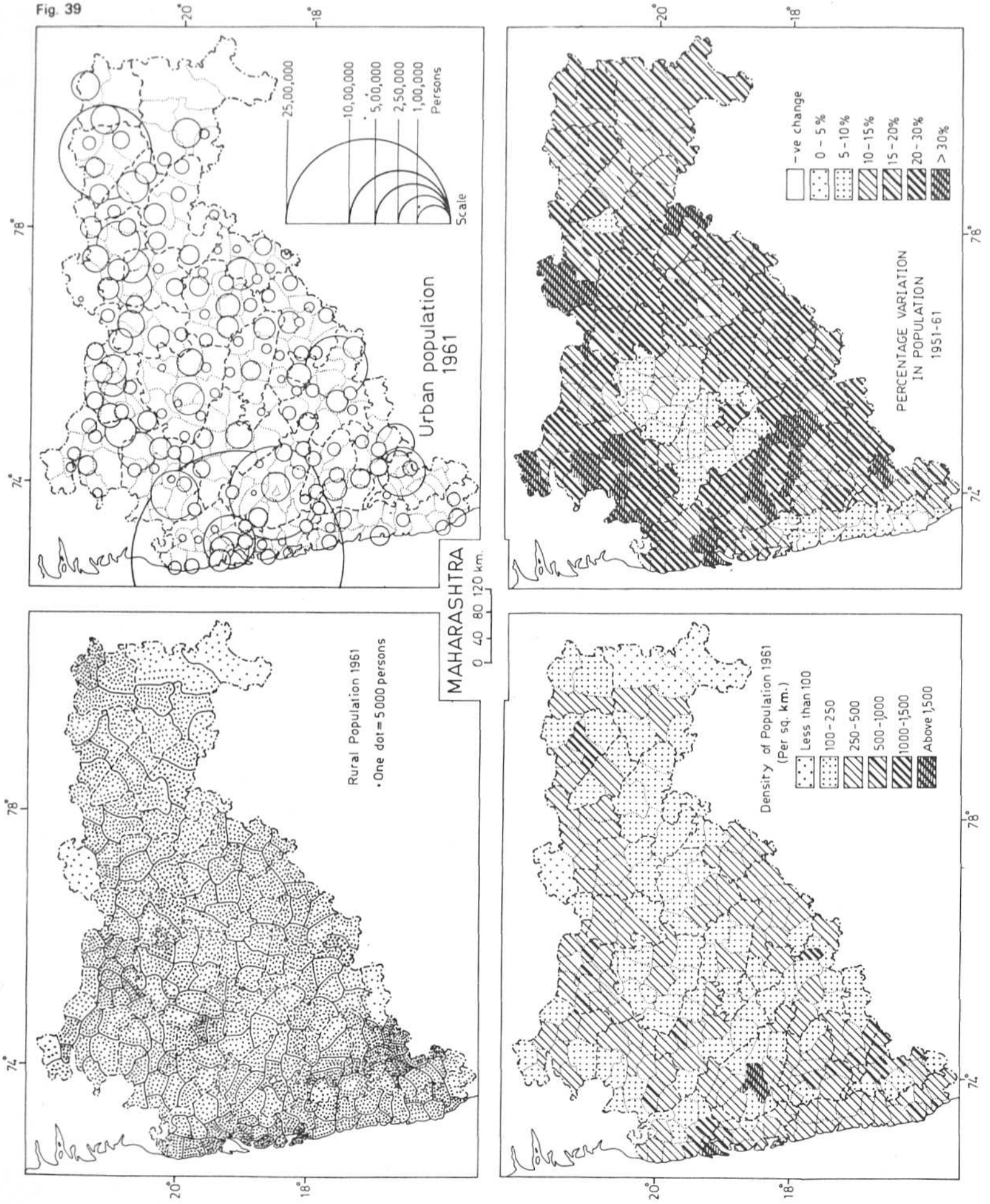
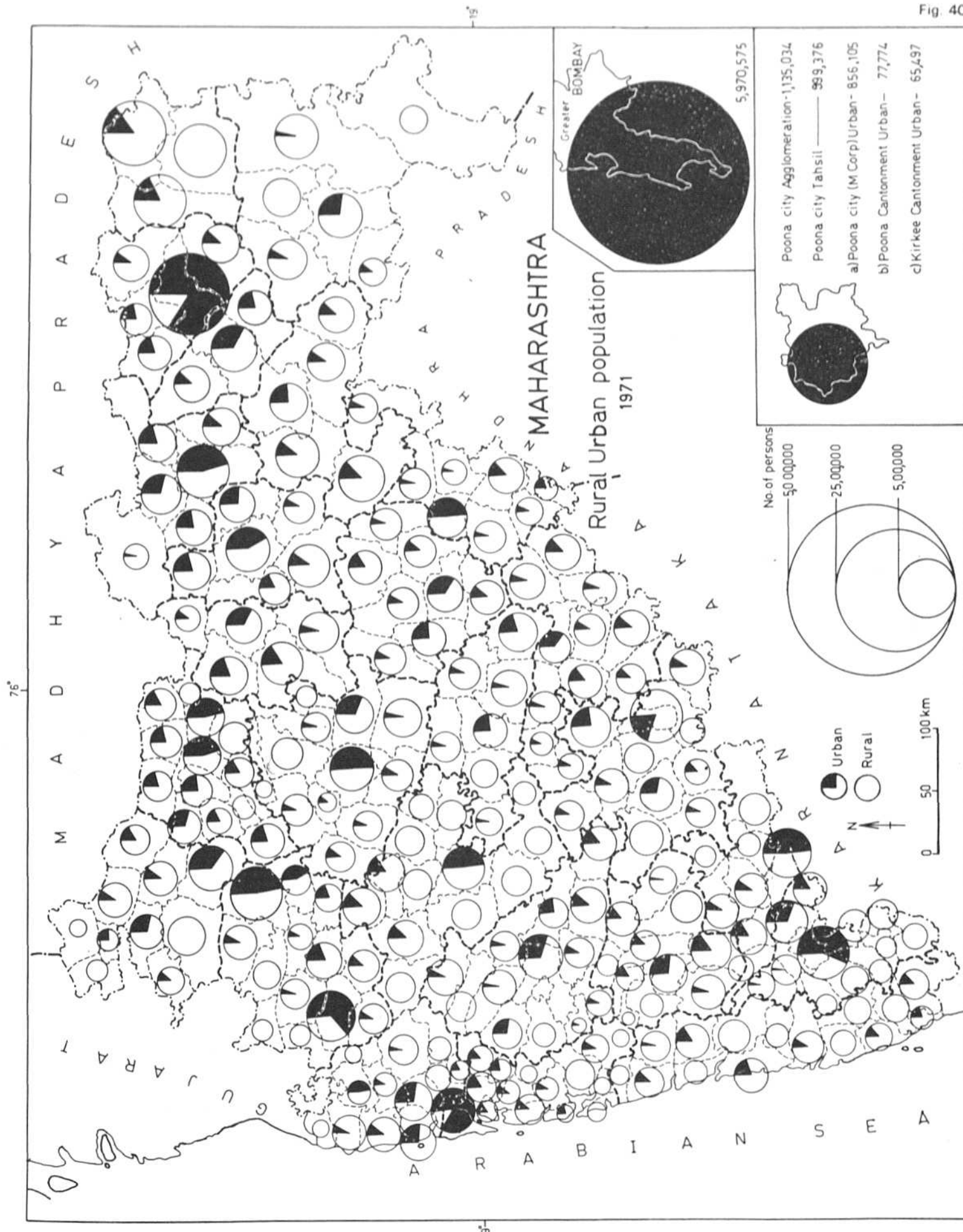
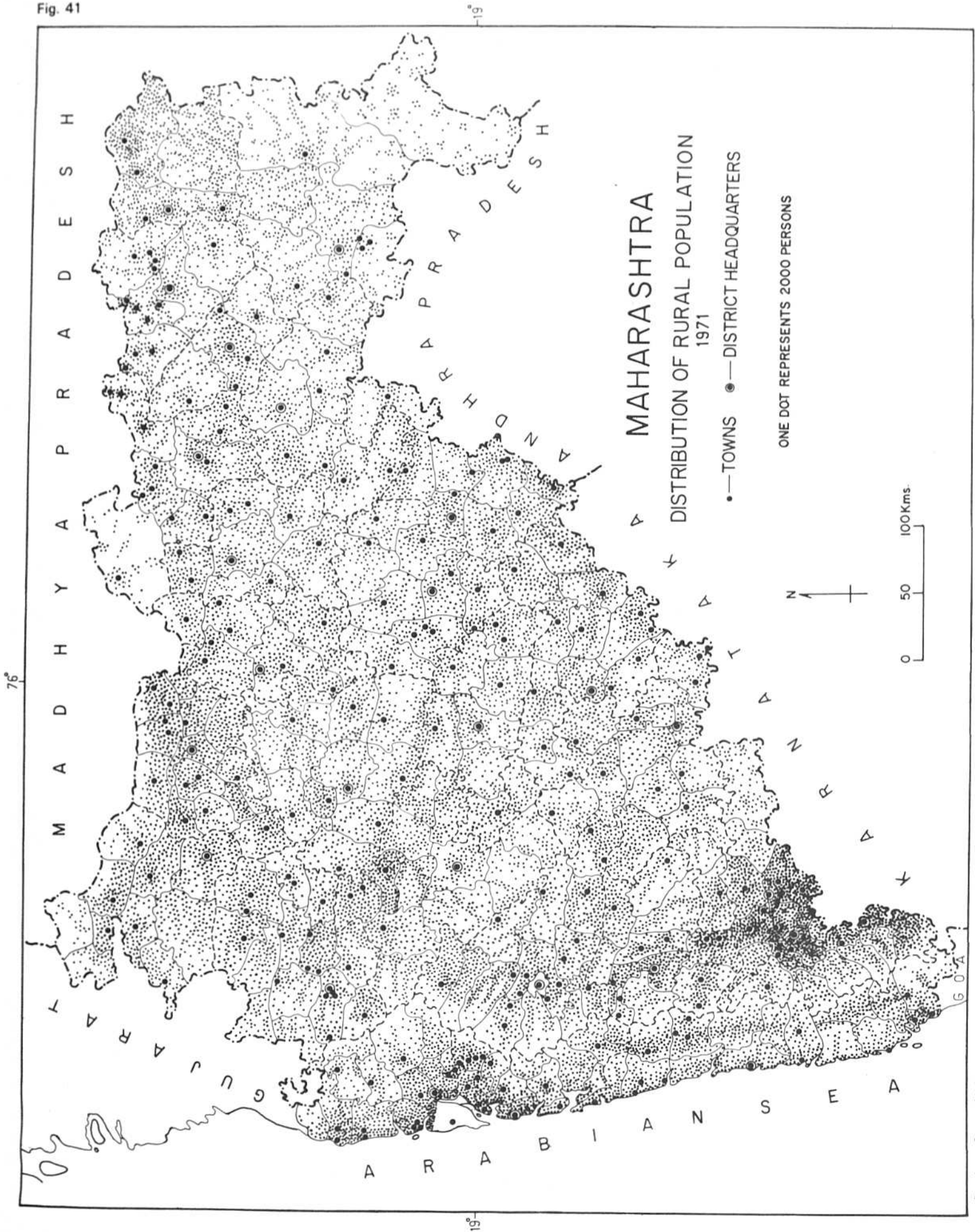


Fig. 40



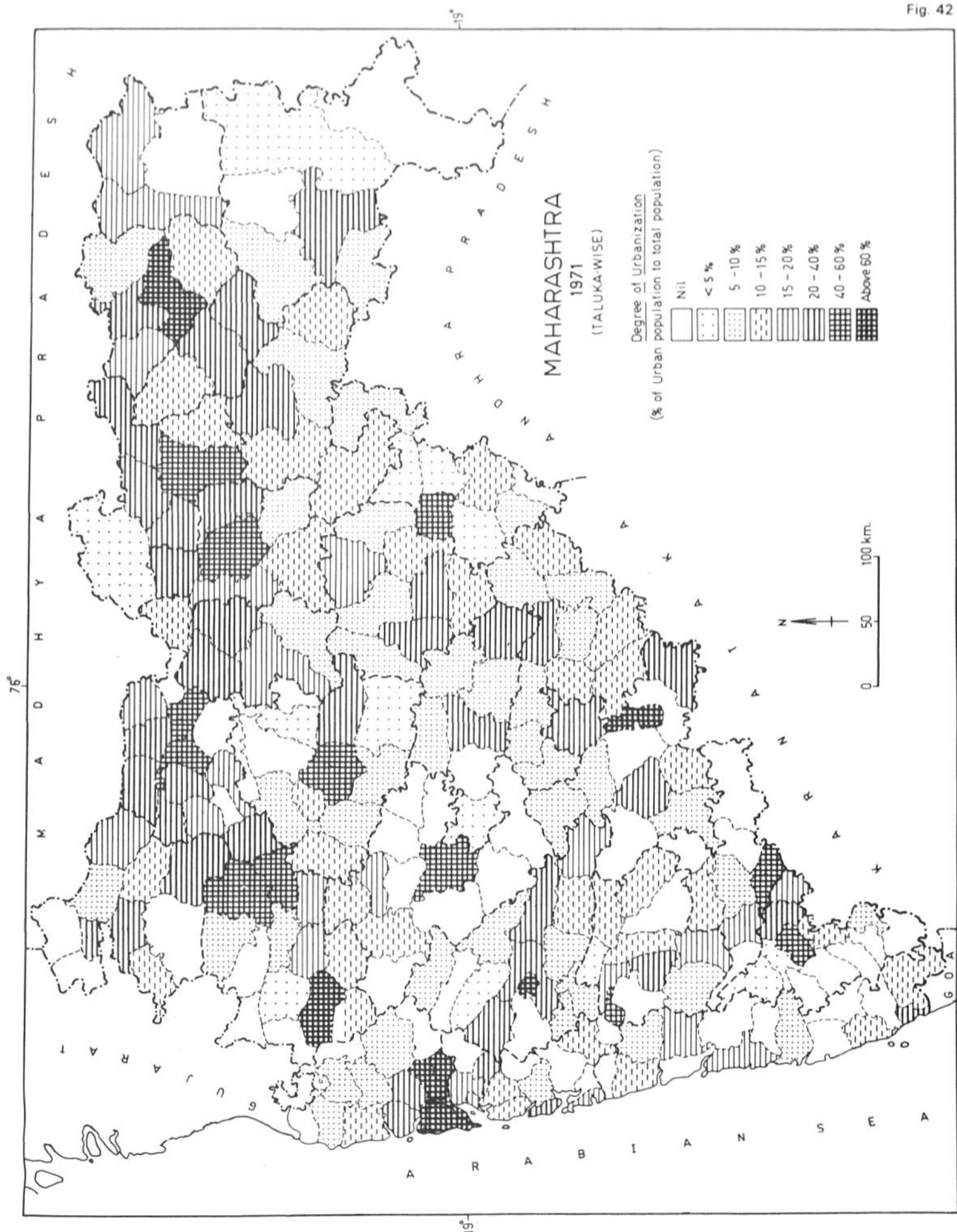
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 41



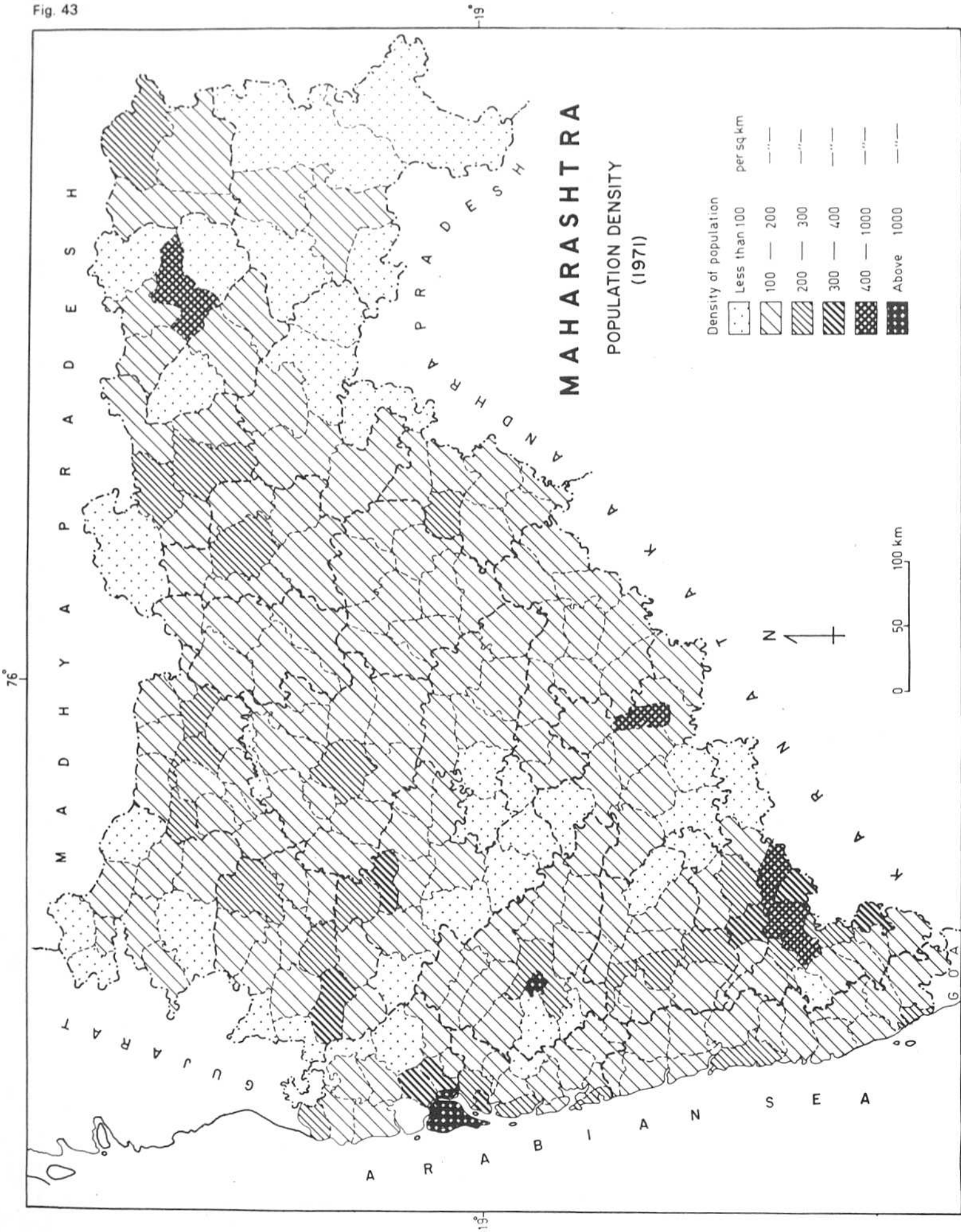
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 42



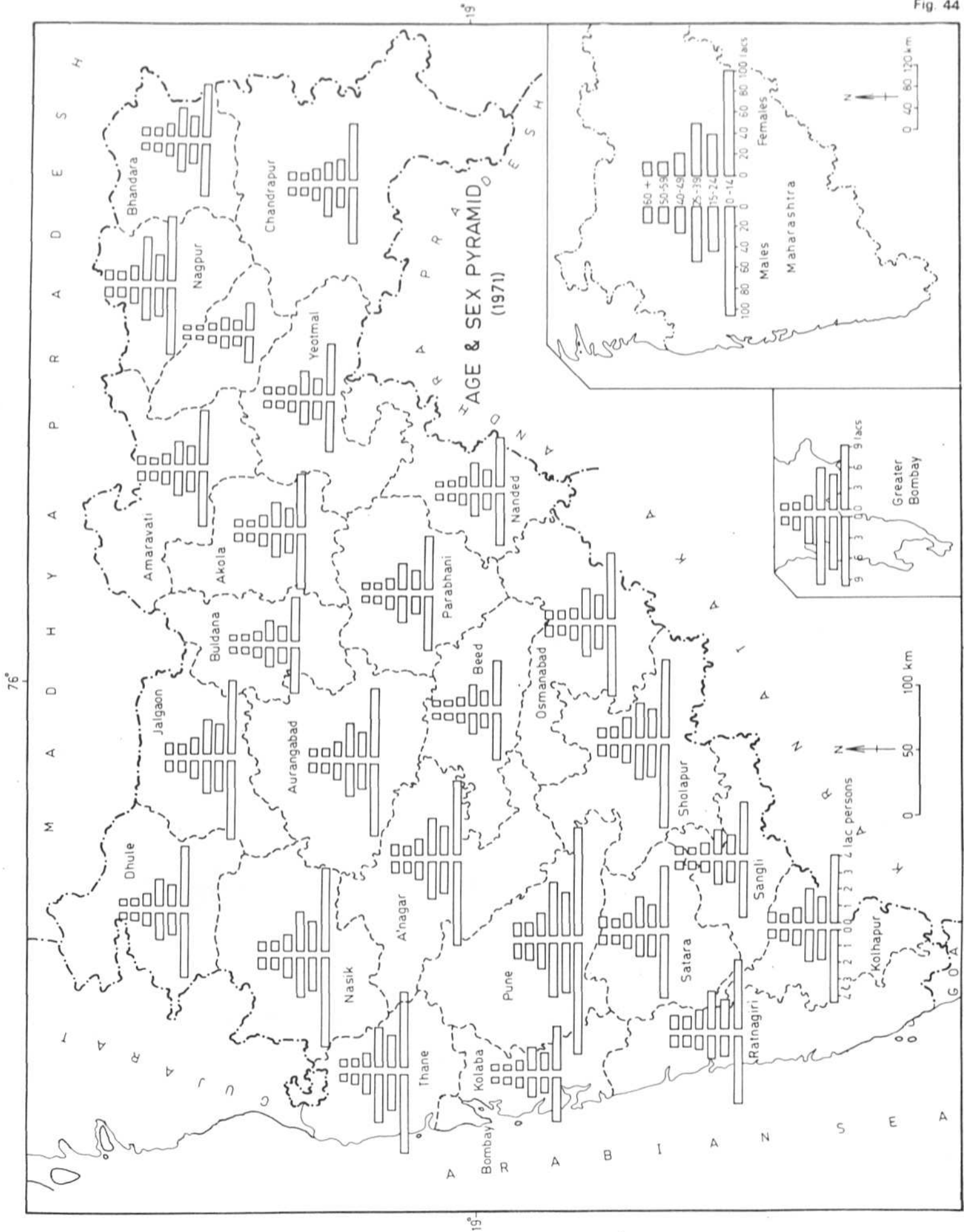
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 43



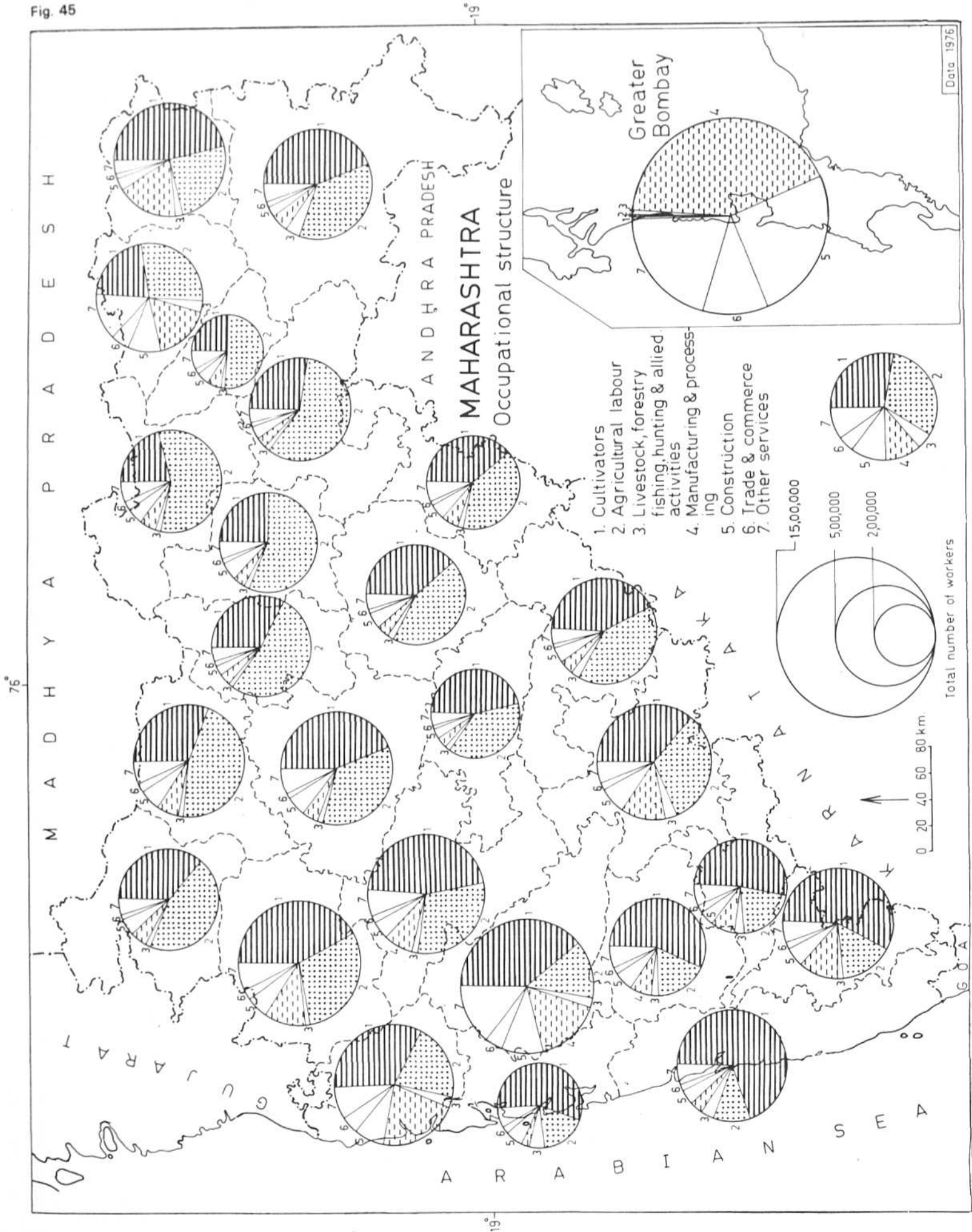
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 44



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1965.

Fig. 45



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985

Fig. 46

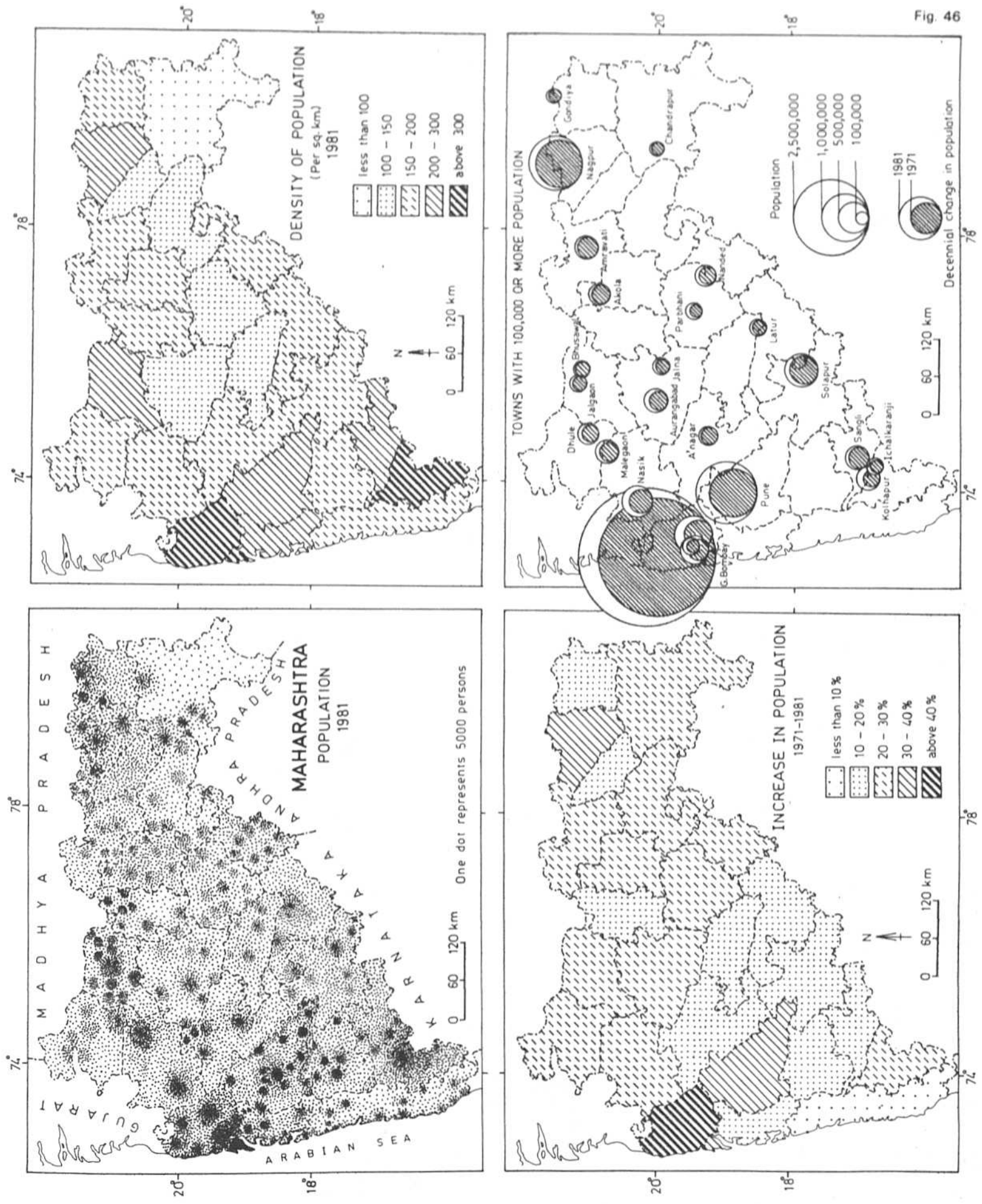
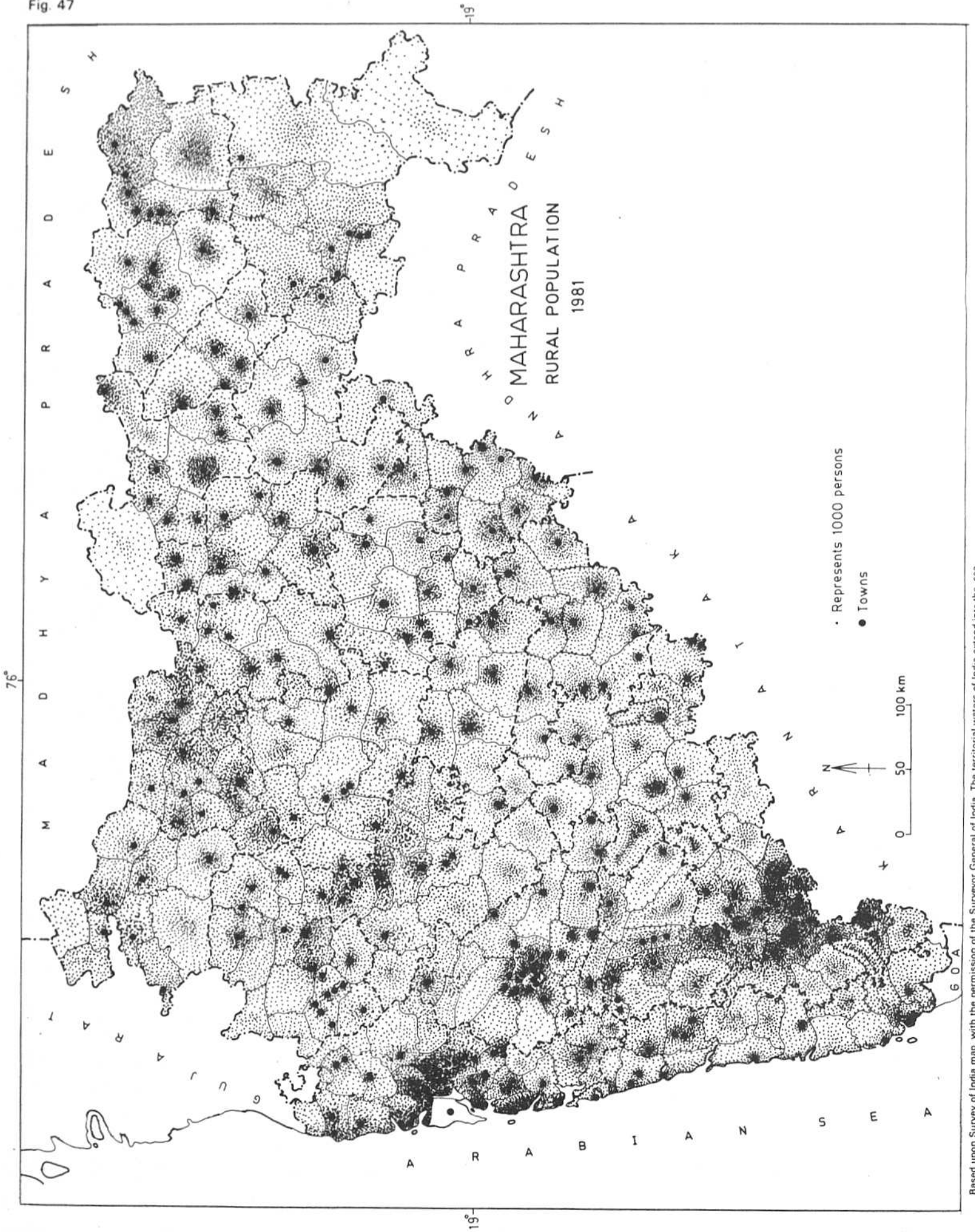
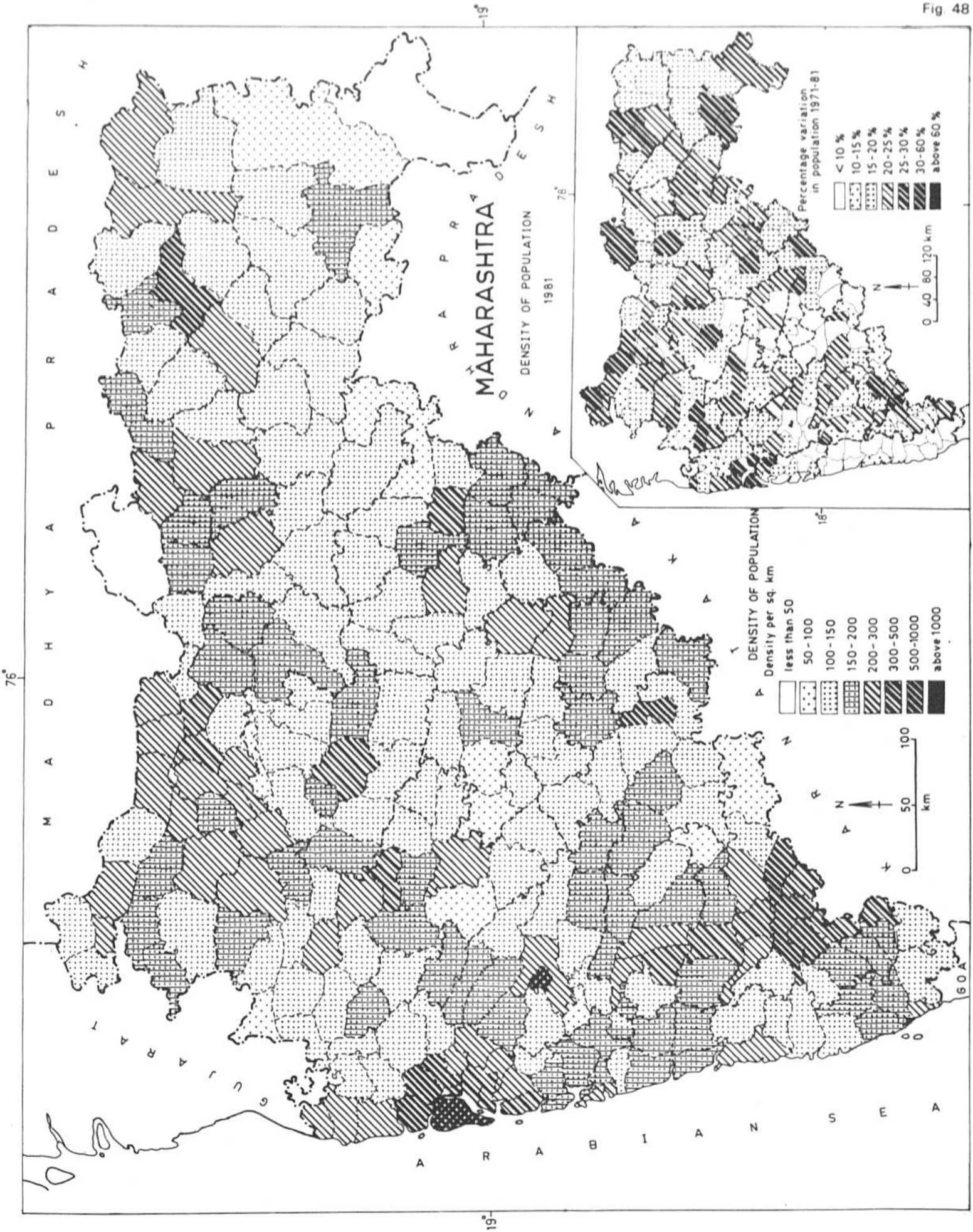


Fig. 47



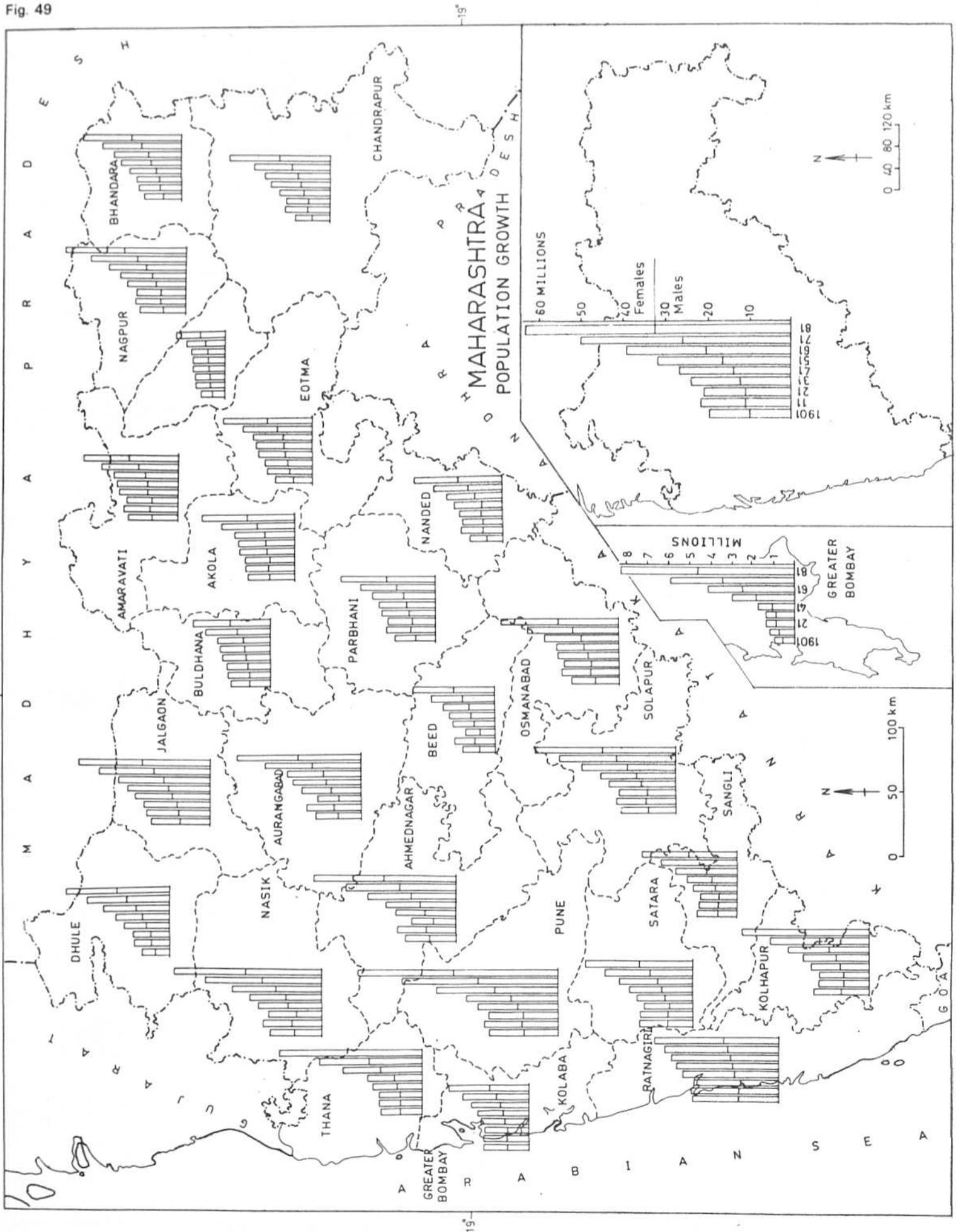
Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig 48



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 49



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

relegated to the background in secular India, still holds a great deal of significance socially. It reflects the cultural attitudes of the people, the institutional organization and other modes of living and behaviour that follow from it. Inherent in the religious composition is a degree of social tension and the conflict of social interests. Both, religious composition and social and caste stratification, and the clash of interests resulting from them, are at the root of some of the worst riots and arson witnessed in Maharashtra—

T-15.2 *Religious composition of population of India and Maharashtra in 1971*

Religious groups	India			Maharashtra		
	Population in the religious group 1971	% of the total Population		Population in the religious group 1971	% of the total population 1971	% of the total population 1961
		1971	1961			
Hindus ..	45,34,36,630	82.73	83.48	4,13,07,282	81.94	82.24
Muslims ..	6,14,18,269	11.2	10.69	42,33,023	8.4	7.67
Christians ..	1,42,25,045	2.6	2.44	7,17,174	1.42	1.42
Sikhs ..	1,03,78,891	1.89	1.79	1,01,762	0.2	0.15
Buddhists ..	38,74,942	0.7	0.73	32,64,223	6.48	7.05
Jains ..	26,04,837	0.48	0.46	7,03,664	1.4	1.23
Other religious groups ..	21,84,955	0.4	0.34	80,023	0.16	0.24
Religion not stated ..	36,083	0.01	0.03	5,097	0.01	....

The composition largely corresponds to the religious composition of the country as a whole, with one major difference being a higher percentage of Buddhists and Jains in the State. Obviously, mass conversion of scheduled caste people particularly the 'Mahars' has led to an exceptionally high figure of Buddhists, in the State.

The Hindus are diffused all over the State; other religious groups have specific areal concentrations and some times even occur in pockets. Muslims, for instance, are concentrated in large towns and Marathwada area. Sometimes, they occur in veritable exclusive enclaves like Malegaon and Bhivandi. They have a good representation in Bombay, Pune, Aurangabad, Osmanabad and Jalna, and dominate the coastal fishing villages on the Konkan coast. Janjira and Murud areas on the west coast have a concentration of Muslim population. The Christians, unlike the Muslims, have preferred the coast and large towns. Missionaries, moving inland from Goa and Bombay, while established cathedrals, seminaries, schools, colleges and hospitals in the towns, they could not penetrate deep among the peasants. Their sphere of work and propagation of Christianity remained confined to towns. They made a tremendous impact on the tribal population, though mass conversion remained confined only to Goa.

An interesting feature of the distribution of Buddhists is its coincidence with the areas of concentration of scheduled castes, the districts of Marathwada, where Babasaheb Ambedkar, himself a Mahar, not only preached social justice but revolted against hinduism by asking his followers to embrace Buddhism. The movement remained confined to Marathwada, but it is to his credit that he weaned away about half the total population of the scheduled castes from Hinduism and created a new group of Buddhists. This explains the size of the Buddhist population standing almost at par with the Muslims in their numerical strength.

Age and Sex Composition

As in the rest of India, half the population of the State is below 20 years of age, and hardly five per cent of the total population survives beyond 60 years. The remaining 45 per cent of the population is distributed among different age groups between 20 and 60 years, with a diminishing progression, 14 per cent in the age group between 20 and 30 years, 12 per cent between 30 and 40, 9 per cent between 40 and 50, and 6 per cent between 50 and 60 years of age.

Thus, one can notice a steady tapering of the age-sex pyramid resulting from mortality in the early age groups. Though the mortality rate slowly increases with rising age group, it is enough to cause a further compressing of the pyramid as one moves towards the peak. This is typical of India's population, or for that matter, of any under-developed or developing country. The steady cylinder like rise of the pyramid where the percentage of people between 20 and 60 virtually remains constant for any age-group, tapering suddenly beyond 65, typical of developed countries, is not to be found. Here the losses due to death are progressive, and not sudden beyond 65 and 70.

Sex ratio.—The general picture, that emerges by comparing the number of persons in each sex, shows a slight dominance of males. This dominance is a common feature of all areas of Maharashtra except the regions which suffer from out-migration of their working population. Ratnagiri and Raigad are the districts where the women population outnumbers that of men. A near parity also exists in some of the backward district like Chanda and Bhandara which are largely inhabited by tribals. A moderate rate of migration of working men reduces their dominance and helps establishing an equilibrium. One might imagine that the transport routes help migration, and the districts traversed by major railway lines may demonstrate a migration, thus increasing the proportion of female population; but this has not happened.

A detailed examination of spatial variation, and the variation in different age groups shows some interesting results.

(i) In areas dominated by large industrial towns, there is a perpetual dominance of masculine population, since it is not only the manpower which, dominated by males, migrates to the area, but even the student population which migrates to such areas is largely composed of males. Thus areas, like Bombay and Pune show a dominance of male population in all age groups.

(ii) In areas of excessive outmigration, it is only the population below 15 years which shows an excess of males, the rest of the population, depleted of man-power, shows a predominance of women.

(iii) The most important fact is that in the age-group between 20 and 40, almost all areas except Bombay, Pune and Nagpur suffer from outmigration of men, and there is dominance of women.

There may be exceptions to these generalizations, but, by and large, this is the pattern.

The important facts that emerge out of the analysis of data are as follows :—

(1) An overall numerical dominance of males over female population in almost all parts of the State except the areas like Konkan districts of Ratnagiri and Raigad and the plateau district of Satara which have been drained off of their manpower by copious outmigration.

(2) Dominance of female population in the age group 20-30 in almost all areas except metropolitan Bombay, Pune, Nagpur and the districts with large towns like Kolhapur and Solapur.

(3) Dominance of males in the young age population group 0-14, usually ascribed to the neglect of girls in India who suffer infant or child mortality.

(4) The most striking fact about sex composition is a very low percentage of womenfolk in the age group 15-19. The percentage for the State as a whole is 55 per cent men and 45 per cent women, but in individual districts and areas, the percentage of women declines to as low as 43 per cent. The record of death register may throw some light on this problem, but according to popular notion, the deaths during pregnancy and child birth coupled with the strains of marriage in a male dominated society in which the brides have to adjust themselves to a new social milieu, appear the principal reasons.

The sex ratio of large urban areas and particularly of Bombay, Thane and Pune is highly distorted because of huge influx of industrial workers. To illustrate this point, the age-sex composition of Greater Bombay, Thane and Pune are given here—

T-15.3 *Age-sex Composition of Greater Bombay, Thane and Pune*

Age group	Greater Bombay		Thane		Pune	
	% males	% females	% males	% females	% males	% females
0—14 ..	51.86	48.13	51.03	48.97	51.10	48.89
15—19 ..	57.69	42.31	53.53	46.47	55.37	44.63
20—24 ..	61.61	38.39	52.42	47.58	51.05	48.95
25—29 ..	61.06	38.94	52.93	47.07	50.5	49.5
30—39 ..	63.22	37.78	55.27	44.73	50.6	49.4
40—49 ..	65.30	34.70	56.86	43.14	53.22	46.78
50—59 ..	63.16	36.84	54.61	45.39	54.42	45.58
Over 60 ..	53.1	46.9	49.32	50.68	50.36	49.64
Total ..	58.26	41.74	52.81	47.19	51.73	48.27

Particularly in Bombay, in the working age group, there is an over dominance of males. In the population above 20 years of age, the female population is always below 40 per cent in all age groups.

Villages and towns

The entire population of 62.7 millions is accommodated in 276 towns and 35,778 villages, spread all over Maharashtra. The division of population between the towns and the villages is not proportionate to their number, since the cities accommodate far more people than the villages. Though the towns form even less than 1 per cent of the total number of human settlements, they account for 30 per cent of the population of Maharashtra. The population of a single city like Bombay is as much as 12 per cent of the State's population. Around 70 per cent of the population lives in villages of different sizes and morphological characteristics—

	Number of settlements	Percentage of population of the State
Villages ..	35,788	68.83
Towns ..	289	31.17

While the number of villages has virtually remained constant over the decade, except for the phenomenon of some villages being deserted, classified uninhabited, because of poor economic base and consequent migration to other areas but more specifically to large metropolitan centres, and the evacuation of some following the building of reservoirs associated with irrigation or hydro-electric projects, the number of urban centres has fluctuated considerably. Chronologically, there has been

a progressive increase, both in the number of towns and the level of urbanization, in contrast to villages whose number has remained constant and the population growth has not been as spectacular as in the towns —

T-15.4 Growth of Rural and Urban population in Maharashtra

Census Year	Total Population	Percentage decadal variation	Rural population	% decadal variation	Rural population as % of total population	Urban population	% decadal variation in urban population	Urban population as % of total population
1901 ..	19,391,643	....	16,174,441	....	83.41	3,217,202	....	16.59
1911 ..	18,225,534	+ 10.74	18,225,534	+ 12.68	+ 84.87	3,248,989	+ 0.99	15.13
1921 ..	20,849,666	— 2.91	16,992,340	— 6.77	81.50	3,857,326	+ 8.02	18.50
1931 ..	23,959,300	+ 14.91	19,502,570	+ 14.77	81.40	4,456,730	+ 15.54	18.60
1941 ..	26,832,758	+ 11.99	21,167,647	+ 8.54	78.89	5,665,111	+ 27.11	21.11
1951 ..	32,002,564	+ 19.27	22,801,551	+ 7.72	71.25	9,201,013	61.57	28.75
1961 ..	39,553,718	+ 23.60	28,391,157	+ 24.57	71.78	11,162,261	+ 21.38	28.22
1971 ..	50,412,235	+ 27.45	34,701,024	+ 22.22	68.83	15,711,211	+ 40.75	31.17
1981 ..	62,784,171	+ 24.54	40,790,577	+ 17.54	64.97	21,993,594	+ 39.82	35.04

It is clear that the towns have benefitted at the expense of villages increasing their relative share in the total population of the State. It is a well known fact that the natural growth of urban population is far less as compared to the natural growth of village population, yet the urban population growth is always spectacular. The factors that contribute to the disproportionate increase of urban population are rural-urban migration and the transformation of rural settlements into towns, primarily by virtue of the increase in their population. Thus, the increasing number of towns and the rural-urban migration, inflating the population of large urban centres, have combined to increase the share of urban population from 16 per cent in the beginning of the century to over 30 per cent in 1971.

Rural settlements in Maharashtra

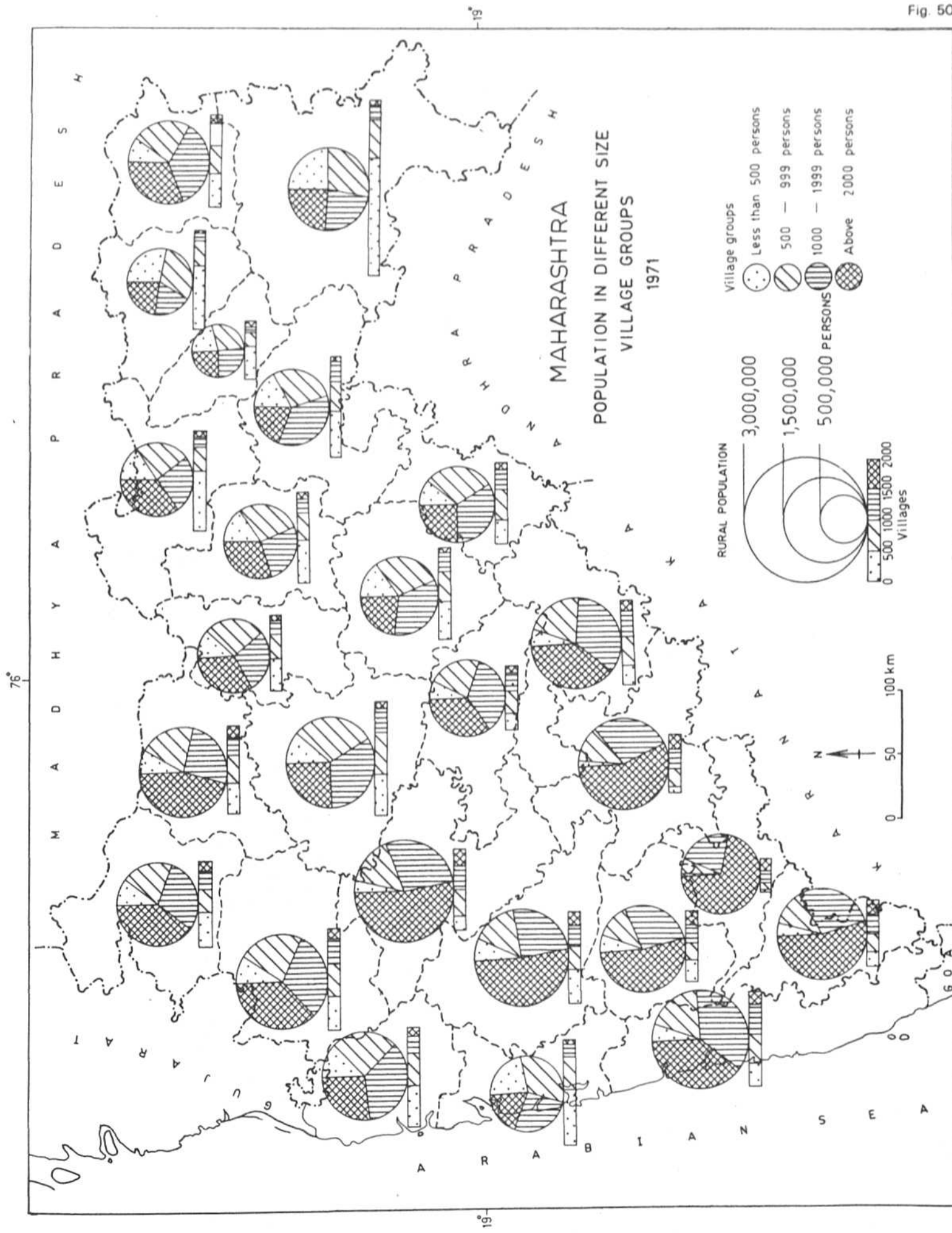
There are 35,778 villages in Maharashtra, some large and some small. About two-thirds of these have a population of less than even a thousand, and only 10 per cent fall in the category of those having a population of 2000 or over.

T-15.5 Distribution of inhabited villages of various population size in 1971 in Maharashtra

Category	200	200-499	500-999	1000-1999	2000-4999	5000-9999	10,000 & over
1. No. of villages ..	5,053	9,088	10,529	7,439	3,102	492	75
2. Percentage of villages in each category ..	14.12	25.40	29.43	20.79	8.67	1.38	0.21
3. Percentage of population in villages of each category. ..	1.58	9.10	21.80	29.4	25.87	9.44	2.81

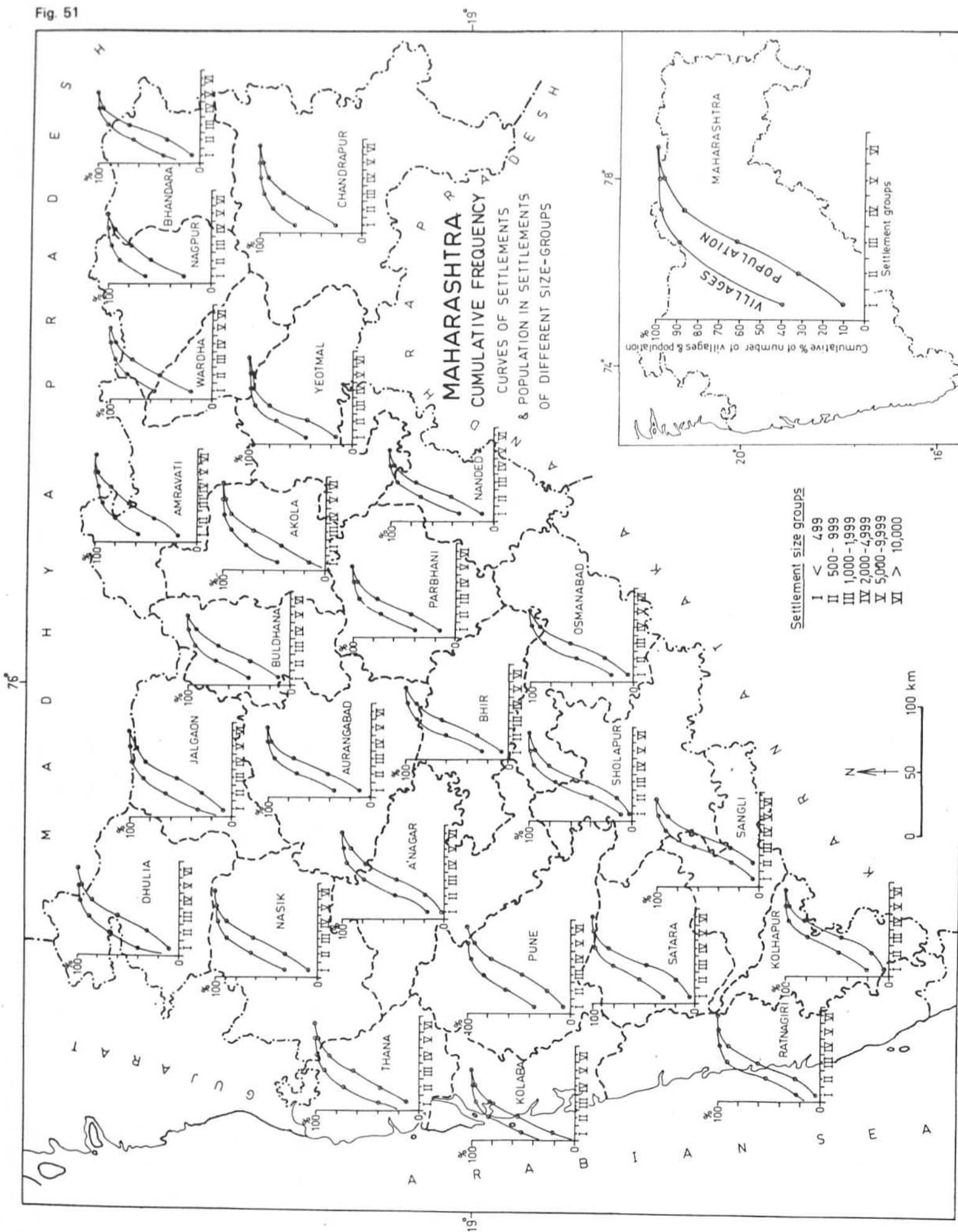
The density and spacing of villages vary greatly, from one area to another, and appear to be a function of relief and the productive capacity of the land. In mountainous and dissected areas, a large number of villages, small in size, have sprung up to utilize small but isolated patches of agricultural land. The Maval tract of Western Maharashtra, the hill region of Satpudas and even the hills of Eastern Maharashtra, have very many tiny hamlets, their population limited to the support capacity of the adjoining land. The Vidarbha region also has a large number of small villages. In Eastern Maharashtra, and particularly the five districts of Amravati, Wardha, Nagpur, Bhandara and Chandrapur, more than one fourth of the total villages fall in the lowest category having a population of less than 200, and majority of the villages have a population of less than 500.

Fig. 50



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 51



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985

The large number of small villages in Chandrapur takes into account the numerous tiny tribal hamlets. The tribal villages are not large and are often represented by a cluster of 25-30 huts, but are counted as villages. But more interestingly, even the non-tribal villages are small. Their small size results from the absence of any constraint that binds the people to an existing large village. A fairly high rainfall and a high water table do not force upon the farmers the necessity to look for a sustained perennial source of water. At any place, water can be struck at low depth. Secondly, the land is fertile and clan is not as strong a factor in Vidarbha as it is in Western Maharashtra. The village, therefore, is not a place where members of the same clan have gone on clustering. The production of rice in Chandrapur and Bhandara, and cotton in the rest of the districts, offered a secure base even for a small population to settle and form a village. Thus, in the evolution of rural landscape, Vidarbha appears to have seen more of second generation villages which invariably were small. Besides these considerations, one of the most significant factors is the cultivation of rice in Chandrapur and parts of Nagpur and Bhandara. Rice is the most labour intensive crop and cannot be managed from a very long distance. The resulting landscape is therefore of more closely spaced tiny villages.

In between the two extremes of Western Ghats region on the west and Vidarbha on the east is the area, where the villages are either medium sized or large. Whereas the Khandesh area has medium size settlements, the Krishna valley has more of large villages. Kolhapur and Sangli are particularly noteworthy where 60 to 70 per cent of the villages exceed a size of 1000. In the fertile Krishna-Panchganga plain, the settlement pattern was stabilized long before the current phase of intensive cultivation. Before irrigation facilities were developed and cash crops had made their appearance, the land was owned by Maratha chiefs in the princely states of Kolhapur and Sangli. The peasants, clustered around the village chief, enjoyed his patronage and cultivated the land. In fact, large chunks of land belonged to one or two families, and the rest of the families worked for them. The incentive to have a house or a wadi close to one's field did not exist, since the genuine ownership did not vest in the actual farmers. Also, an extensive cultivation did not require the perpetual presence of farmer on the farm. The traditional bond of the peasant with the village chief and the clan were too strong to permit the farmers to leave the village. The situation today is changed, but the villages have retained themselves intact.

The Village in Maharashtra

A village in Maharashtra, as any where else in India, means a specific area having a definite boundary, and demarcated from other villages for the purpose of revenue and other developmental administration. Thus, it is a specific areal entity. At the same time, it is also a human settlement, a cluster of houses with an approach road, a perennial source of water, a common temple or a village Panchayat and inhabited by people whose primary occupation is farming and who depend for their living on the produce from the village land.

Morphologically, a village in Deccan is not a stereotype settlement and its characteristics vary from the rainy Konkan to the dry interior, changing on to a type that merges with the settlements of Madhya Pradesh on the one side and Andhra Pradesh on the other.

A village in Konkan is a small cluster of houses. It could be on the plateau, on the coast or along a river entrenched in the plateau. The plateau villages often large, are usually located along the roadside. The coastal villages and the estuarine settlements represent the typical rural settlements. A coastal village could be either an agricultural settlement in which case it is located on a flat alluvium-covered littoral platform or a river mouth plain. Such settlements have scattered houses with groves of bamboos and other trees like jackfruits, mangoes and arecanuts, and appear like a farm house. These villages grow rice in small patches, covered with coastal alluvium. The river-side villages have a linear arrangement. The flats along the river are the scene of intense rice cultivation, followed upward by individual houses in the midst of groves and backed by a rising valley side, that finally opens out on the plateau. Such villages, strung along the deeply entrenched rivers, are not visible from the plateau tops and are exposed to view only after descending into the valleys. These are largely agricultural settlements in which the houses are scattered and well spaced, the intervening space being filled up with trees, the coconut and arecanut occupying the margins of the paddy fields. Some villages located on the promontories overlook the sea and are fishing villages, with intense activity in the evening when the fishermen return with the day's catch. The houses in these villages are arranged in tiers from a few feet above the water line, rising almost to the top of the promontory. From distance, the village appears an assemblage of well arranged terraced houses. On the plateau (the Konkan plateau) itself, the houses are usually along a road and their frequency is more at the foot of the Sahyadris where the alluvial basins of the rivers are open and offer fertile land for agriculture.

The individual house in Konkan is raised on a plinth with mud or laterite walls and tiled roofs. The sloping roofs from the central beam has a wide enough expanse, and the house is divided into compartments one behind the other. The front portion starting from the entrance is known as 'Padvi' followed by 'Osari' and a 'majghar' the central part of the house, backed on the rear by the tiled space known 'Parasdar'. The 'Padvi' usually has a few windows. The courtyard on the rear has, in a few cases, a well and the bathing space for women folk.

The most commonly used building material is mud for the walls and tiles for the roofs. The well-to-do use stone or brick for walls and provide a very graceful appearance to their house by tiles. The poor families thatch their roofs with bamboos, leaves or ricestraw. The houses of the tribal people are all alike, and the village is a cluster of circular huts thatched with leaves and straw. The location of tribal villages on the western slopes of Sahyadri ranges reflects their landless status as well as their absolute low rank in the social organization. Perched half way on the slope, between the hill top and the river, a tribal village is a cluster of circular huts made of reed walls, plastered with mud, and a conical roof thatched with leaves or straw. Such sites have the advantage of securing proximity to the forests off which the tribals, partly, live, but these have the disadvantage of social isolation. Most tribals being landless and devoid of any urge for social integration, this isolation does not afflict them. But, the greatest disadvantage they experience is the unavailability of water during dry summer, when the womenfolk wend their way through the rough terrain and descend several hundred metres below their huts, to fetch water from a water hole in a river channel.

The village structure and the houses on the plateau of Maharashtra reflect the general climatic condition and the traditional poverty of the jirayat farmers. A village, irrespective of its size, in the drier parts east of Poona, appears, with its low flat profile and colourless muddy appearance, an assemblage of ruins, a half destroyed settlement, which really it is, and absolutely monotonous. It is not shrouded in groves of evergreen trees and bamboos, but stands exposed in all its nakedness. One encounters only a few trees, a few of them with a platform around them. The entrance to the village is well delineated, marked either by an approach road, bifurcating from the main road or a well trodden footpath.

A plateau village may be walled or unwalled. Usually a large village owned and inhabited by some Maratha chieftain is walled. The organization and the arrangement of houses in an unwalled village is different from a walled one which among other things has a 'gadhi', a fortress, as its distinguishing feature. As one enters a village, one is heralded by a few ruins, stray cattle, and leisurely wandering buffaloes and a few people. None of the villages has a regular plan. Winding streets of unequal width are lined by houses. Inside the village, though not necessarily at the centre, are a few community offices which include a village Panchayat office attended by a gram sevak and a 'talathi', the revenue official on the lowest rung of administrative hierarchy. Some times, these two officials share a common room in the Panchayat building which also houses a conference hall and a store-room. A primary school and occasionally a high school forms part of the same complex. In some villages, the village temple and the Panchayat office are housed in one and the same building. A 'Ganapati' or a 'Maruti' temple is the most common sight. The traditional meeting place for the village folks has been a 'Chavadi' with or without a temple, often under a tree. But, of late, the venue is shifted to Panchayat office, since the elected 'Sarpanch' of the village claims precedence over the hereditary village Patil, and has virtually usurped the functions of the latter.

In most villages, about 1/3 to half the houses are deserted and stand in ruins, littered with rubble. These ruins are not only an ugly sight, but also a source of pollution. If the village is on a roadside frequented by omnibuses, the bus stand is the focus of activities, and many retail shops and important public utility services develop in the vicinity. A high school, a post office, a bank, a veterinary service centre, a seed godown, all may be located in a few buildings, newly constructed along side the road. The weekly bazar if any, is also held on the roadside. Thus, a small zone of commercial, social and political activities has emerged, of late, along the road close to the bus stop. In case of a large village, which may be a rural service centre, a number of functions are located on the road to ensure maximum clientele and accessibility. This phenomenon of road side development has not touched smaller settlements away from the road.

The arrangement of houses inside the village follows a block or a linear pattern. Houses belonging to different castes are arranged in a block or in a lane. Despite the segmentation according to castes, specific areas of the village or the lanes are not always named after them. This, no doubt, is the case of very large villages. Each village has one or more wells for drinking water.

The plan of the houses varies with the region, the occupation and the economic status of the villagers and proximity to towns. In most cases, a house is a simple stone or mud wall structure with a mud or corrugated iron roof supported by beams. Only very well-built houses belonging to well-to-do people have a courtyard. The enclosed space on the rear of the house is used as cattle shed. The houses are not well ventilated. In the villages near the cities tiled roofs have started appearing. With stone and mud walls, these present a respectable appearance. Corrugated iron sheets are more in use in the villages close to towns. In large and walled villages, the 'gadhi' belonging to the village chief, who no longer commands the traditional respect, stands imposingly in one of the four corners. The importance of such gadhis has since declined but these remind a casual visitor of the supremacy of the Maratha chieftains under whose patronage the villages once lived.

Spatial Diffusion of the village settlements and the growth of 'Wadis'

Most large villages on the plateau have "Wadis" which sometimes account for more than half the population of a village. A 'wadi' is a smaller settlement, a cluster of only a few houses owned by people having the same clan and lineage who originally lived in the mother village, and subsequently migrated close to, or in the midst of, their fields. The tradition of Wadis is not new, though the Wadis have proliferated during the last fifty years. Originally, the scheduled caste population lived outside the village in small settlements commonly known as 'Maharwadas'. This was not because of their own volition, but resulted from a degree of social stigmatization. Such detached settlements were also inhabited by shepherds and fishermen and the wadis were known as Dhangarwadi or Koliwada. The migration of an individual or a group of Maratha families to form a 'Wadi' within the limits of the revenue village stands at a different footing. In this case, a few families that were bound to the village socially moved to their farms, as they found that living as part of the village community was not very advantageous but, on the contrary, proved a handicap in managing the fields located quite far from the 'gaonthan'. When exactly did the process of 'wadi' development start, and in response to what, is difficult to surmise, but a greater sense of security that dawned on the peasantry following the arrival of the British rule and a tighter and more formal administration may have loosened the village bond. The security enjoyed by the landowning peasantry encouraged them to settle in a more advantageous location close to their fields. The practice may have started with building a store room for implements or a cattle shed, but in due course, changed into a wholesale migration of the entire family. Other reasons for a spurt in the growth of 'wadis' can be enumerated as follows:—

- (i) Virtual elimination of the need for collective living for reasons of security or defence.
- (ii) Increase in population and the need for more production through intensive cultivation, and better care of fields and crops.
- (iii) Rise in the economic status of the people and a greater sense of enterprise.
- (iv) Awareness of the needs and benefits of irrigation for higher yields and hence concentration of efforts on developing a well, and living close to it.
- (v) Rise in water table as a result of bunding practised on a large scale during the last thirty years and relative ease with which water could be struck.
- (vi) Support by the State Government in developing sources of irrigation.

The building of a well both for drinking water as well as for irrigation provides a nucleus around which a family grows. Over the years, not only the population of the original migrants increases, but more families having farmland in the vicinity also join the wadi increasing its size. A large village has several wadis, and sometimes their number is as large as 25 or thirty. A wadi is usually inhabited by people of the same caste, but occasionally one or two more castes may join. It does not have any of the non-agricultural functions. The village 'balutedars' like a barber or a dhobi are always associated with the parent village and do not move out. In fact, the wadis have to depend for shopping and other contacts with the Government and semi government officials on the main village.

The Social Organization of a village in Maharashtra

The head of a village is a Patil, whose functions, in a large village, are divided and assigned to two Patils instead of one. Thus, a large village has a general purpose Patil and a Police Patil. The former carries the traditional responsibility of leading the village, settling disputes and organizing the village for some common purpose, while the latter maintains a liaison with the police and is notionally responsible for maintaining law and order. The establishment of Village Panchayats and the appearance on the scene of the elected Sarpanch have weakened the position of the general Patil, but Police Patil still remains important.

The traditional village organization rested on a three-fold division of the village folks into peasantry, the landowning or land tilling agriculturists, the 'shetkaris', the supporting artisans, and the service-group, called balutedars. The balutedars, numbering twelve, (bara-baluta) are so called because they are the beneficiaries of the institution of 'baluta'. "Baluta is the payment given in cereals or money or a little land to people of artisan castes and to those who render certain necessary services." The potter, the goldsmith, the carpenter, the ironsmith, the washerman, the barber, the village priest, the mahar, and the mang—all are included in the rank of Balutedars. Reportedly, there was a three tier hierarchy among the balutedars. Some of the balutedars were granted agricultural land by the village called 'Vatan' and the balutedars holding such 'Vatan' land were called 'Vatandars'.

There is a certain order in the locational arrangement of the houses belonging to different castes. The Mahars, usually occupied a place outside the wall, in case of walled villages, close to the entrance. They guarded the village against possible attacks or encroachment. Other 'balutas' and particularly, the washerman, barber and ironsmith, though located inside the village occupied a peripheral position and the Marathas occupied a relatively median location. In open villages this arrangement did not exist, but the houses of Mahars, 'Mangs' and 'Chambhars' were always situated either outside the village or on one side, quite detached from the main village.

The village in Maharashtra today

The changes in the layout and morphology of the village are minimal. The village settlements, have, no doubt, suffered from the migration of the people to industrial centres. The houses deserted by the migrants have degenerated into ruins. No doubt, every village, and particularly a large village, has a new acquisition, a village Panchayat office, with a flagpost in front, where the village youth and old assemble. A few houses are rebuilt or newly built, and carry with their storeyed buildings, cement floors, tiled roofs and strikingly bright paints, a sign of newly acquired prosperity. The well-to-do, who have a large acreage of land have switched over to the use of tractor and other agricultural implements and amassed riches. The use of electric pumps, fertilizers, better seeds and other agricultural innovations has brought relief even to a medium sized farmer, but farmers with small holdings and landless have not witnessed much change in their life pattern. Electrification of the village, visit of doctors and the village level workers, a bank, or improved accessibility are apparent gains to the village, but these have not made any significant impact on village development. Wherever an irrigation project has developed, the general agricultural productivity has been boosted up, a new cropping pattern, in which cash crops like sugarcane and grapes are spectacular, has emerged. In some cases, a sugar factory has grown and an atmosphere of general prosperity has made its appearance. But even in such villages, the poor and landless have not improved their condition much.

The scheduled castes section of the village population appears to have made some progress. With free education and scholarship to their children, reservation in employment and priority in many other areas, they tend to migrate to the towns. The development programmes of the Government have been effective in starting at least one primary school in every village, a bank in a large village, ensuring improved accessibility to most villages, and introducing primary health services, and gearing up the Government machinery for village development through the Block Development officer, who is responsible for the development of a block of villages. A large number of development schemes like employment guarantee scheme and food-for-work scheme have been floated by the Government but they have yet to make a spectacular impact on village life.

□ □



CHAPTER XVI

TOWNS AND CITIES IN MAHARASHTRA

A town or a city is distinguished from a rural settlement both by its function and size. That the towns are larger than villages, and not infrequently attain a gigantic size in their population, does not make population the basic element in the character of a town. It is the non-agricultural function which is basic to the development and growth of towns. Their large size is the consequence of a widening functional base. By and large, most towns started as non-agricultural settlements and grew into larger and more complex cities. Purely agricultural settlements grew at best into local service centres.

The earliest towns in Maharashtra, as anywhere else, were the capital cities. Sopara, Paithan and Junnar are the three notable capitals that existed even before the first century A.D. Sopara (Surparaka), a settlement 35 km. north of Bombay, was the capital of 'Aparantaka', a province in the Ashokan empire. Paithan was the capital of 'Petenikas', the early rulers of Paithan, and Junnar came to be the capital of Kshatrapas in the first century A.D. In the second century A.D., Paithan passed into the hands of Satvahanas. The town lying on Godavari, was perhaps the most flourishing town of Peninsular India in the second century A.D. As the capital of Shalivahanas, it enjoyed their patronage and was the focus of all activities. Ptolemy speaks of Paithan as the greatest city in Dakshinabades (Dakshinapatha). It had trade relations with the Mediterranean countries exporting onyx. Geographical centrality may have been a major consideration with the Shalivahanas who adopted and developed Paithan as their capital. Located on a creek head, Kalyan was another important city that has an inland location and was easily accessible from the sea. It was the capital of Chalukyas in the 11th century. Karad and Kolhapur are often mentioned as early urban centres. Karad existed in the first century A.D. and was an important town during the rule of Shalivahanas. It was also the seat of one branch of Silhara dynasty in the late 12th and early 13th century. Located on the confluence of Krishna and Koyna, the place has acquired some religious significance. A striking phenomenon about the location of Karad is its rich upland with a fertile soil, adequate rainfall and a high agricultural productivity. It is obvious that being the capital of a feudatory prince the town had to depend on its regional agricultural surplus unlike the capitals of the large empires which funnelled into their making the resources of a large territory.

The antiquity of Kolhapur is established from the discovery of a Buddhist stupa in the vicinity. During the 12th century, the town was the capital of one of the Silaharas. That the town enjoyed the patronage of the Silaharas is clear from the temple of Mahalaxmi, since they were the followers of Puranic and Vedic religion. Mention has to be made of Achalpur and Deogiri in the category of old towns. Achalpur was the capital of Rashtrakutas, though their main branch had its capital at Malkhed. Deogiri was the capital of the Yadavas and remained in their possession till 1294, when it was captured by Alla-Uddin-Khilji. Deogiri can be considered both, an old and a medieval town. After its occupation by the Muslims, its name was changed to Daulatabad, which stands in ruins today and its place is taken by another town Aurangabad in the vicinity that was founded by the kings of the Nizamshahi dynasty in the early 17th century.

In addition to the capital towns, a larger number of trading ports dominated the Arabian sea coast very early in history. Besides, Sopara and Kalyan already mentioned, Puri, Shiristhana (Thane), Chaul, Uran, Nagothana, Roha, Shrivardhan, Bankot, Jaigad, Kharepatnam and Malwan are some of the very old port towns. Inadequacy of inland transport often led to the development of coastal towns on the sea creeks, far inland, to command a larger area. In fact, sea-creeks commanded the best sites for the sailing vessels which did not require much draught and could easily ply a considerable distance inland giving rise to small break-of-bulk towns. Some of these port towns existed as early as the first century of Christian era, and are mentioned by many ancient voyagers. Ptolemy mentions Calliena (Kalyan), Semulla (Chembur), Mandagara (Mandad), Palaipatmai (Pali near Mahad) and Melizeigara (Jayagd). Irrespective of size, it appears that the towns were more numerous on the coast and received the attention of foreign traders. Water transport was the most economical and the safest mode of transport in the early days and a creek-head location was both, a site for handling maritime trade as well as a central place occupying a focal point in the collection and distribution of regional goods. These towns have not grown much and the advent of stream navigation has made them defunct as international ports. These are now no more than small fishing centres with country crafts plying in and out.

Many of the towns were linked with transport routes, particularly the routes that traversed the Western Ghats from the Konkan to the plateau. Wai, Bhor, Lonavala, Wadgaon, Patan and Junnar—all these are the gap towns located close to the ghats where the roads traverse the Western Ghats.

During the medieval period, the growth of towns was guided by the requirement of defence, administration and trade. Many provincial headquarters like Gawilgarh, Daulatabad and Mahur sprang up. Besides the regional headquarters, a number of fort-towns like Parenda, Naldurg, Panhala, Elichpur and Narnala also appeared on the scene. Many of these regional headquarters and the fort-towns were developed during the Bahmani rule. The disintegration of the Bahmani empire witnessed the emergence of small independent dynasties.

Ahmadnagar and Bijapur were the capitals of two such dynasties, the former of Nizamshahi and the latter of Adilshahi. During the Maratha period, there was virtually no growth of new towns, though Pune and Satara gained in importance.

During the British period, the laying of the railways and the roads opened a new dimension in the process of urbanization. The improved transport had a two-fold effect on the growth of towns; firstly, there grew a large number of market centres, and secondly, the settlements on the railways or the main highways grew into towns. One can notice even today the string development of towns along the railways. The settlements along the railways grew much faster than in the interior. Many of these settlements became, in due course, a hub of transport and a regional centre for the collection of agricultural produce and the distribution of finished goods. The railways provided the necessary impetus for the cultivation of cash crops as the prospects of their export improved. Transport improved trade and increasing trade promoted the growth of towns. The systematic organization of administration with divisional, district and taluka headquarters also brought into existence a mosaic of towns. Many of the towns located on the railways, like Bhusawal, Jalgaon, Deolali, Igatpuri, Manmad and Chalisgaon were mere village settlements in the last quarter of the nineteenth century, and have since grown into large towns. The pre-existing towns on the railways, on the other hand, showed a spectacular high rate of growth, as illustrated by Nashik, Pune and Solapur. Road transport also helped the growth of towns. Dhulia, Malegaon, both situated on the Bombay-Agra road have shared the benefit of road transport and grown into large towns.

The latest phase of urbanization in Maharashtra was ushered in with rapid industrialization of the State. After the Second World War, and concurrent with the independence, industrial growth became synonymous with development. In all development programmes industrialization got a priority. Rapid industrialization produced urbanization as result of the increase in the population of industrial centres and the accretion of population on the sites of new industries.

The industrial towns of Maharashtra fall into one of the four categories—

- (1) Major industrial cities
- (2) Industrial clusters
- (3) New and minor industrial towns
- (4) Industrial townships

Bombay, Pune and Nagpur constitute the major industrial cities of the State. Kolhapur, Ahmadnagar and Nashik are also attracting industries, and may, in due course, become major industrial centres. The spatial alignment of these centres has produced industrial belts and clusters. Bombay-Thane-Kalyan-Panvel-Uran is an industrial belt, contiguous to Bombay. This could be termed an 'Industrialopolis', a loose ribbon, linearly oriented cluster of settlements, supported by industries. Smaller industrial centres like Shrirampur, Ichalkaranji and Kopergaon are new towns which developed following the growth of industries. A number of townships like Ogalewadi and Kirloskarwadi owe their existence solely to industries.

Today industry is the most dominant factor of urbanization. It has accelerated the process of rural-urban migration, and the creation of new, and enlargement of existing urban centres. In a country like India, the level of urbanization is related to the degree of industrialization.

Phases of urbanization in Maharashtra

One may summarize the history of urban development of Maharashtra by dividing it into four phases. The earliest phase was characterized by capital towns, port towns and the towns commanding major transport routes. The towns, then, were far and few between. The village societies were almost self sufficient, and no town developed without the patronage of a king or a ruling dynasty. A capital city was both a governmental seat and a trade centre. The port towns were of secondary importance.

The second phase of the urban growth in the State began with the coming of Muslims in Peninsular India in the 12th century. Defence and revenue administration became the two important functions of the towns. Majority of the towns were, therefore, fortified and often enclosed by a wall. A fort town is the most common prototype of a medieval city. The number of towns multiplied because of the increasing number of ruling dynasties, each of which administered a small territory and had a capital of its own. The headquarters of 'Subedars' which were often fortified also became, in due course, full-fledged towns.

The third phase was ushered in with the introduction of the railways and the improvement of roads. These added a new dimension in the spatial organization of towns. The overall improvement in accessibility encouraged the cultivation of cash crops and the rise of a number of market centres. Small settlements on the railways, or along the roads, soon became towns of a moderate size. Through improved transport, the region started participating in the larger economic strategy of the country. The cultivation of cash crops got a boost and the centres of collection proliferated. To this period of the late nineteenth and early 20th century, is ascribed the string development of towns along the railways and important highways.

The latest phase in urbanization is that of industrial development and concomitant growth of urban centres. During the last fifty years, industrialization has become the most significant factor in determining the urban pattern of the State. It has led to the enlargement of existing towns, growth of new ones, and the creation of urban complexes, loosely spread, and creeping along the arteries of transport that threaten to engulf the inter-urban space.

The Level of Urbanization and Growth of Towns

With a qualitative change in the processes leading to urbanization, there has been a perceptible change not only in the level of urbanization but also in the number and size of towns.

T-16.1 *Urbanization in Maharashtra*

Year	Urban population	Urban population as % of total population	Variation	No. of towns
1901	3,217,202	16.59	....	219
1911	3,248,989	15.13	+ .99	232
1921	3,857,326	18.50	+ 8.02	238
1931	4,456,730	18.6	+ 15.54	258
1941	5,665,111	21.11	+ 27.11	266
1951	9,201,013	28.75	+ 61.57	383
1961	11,162,261	28.22	+ 21.38	266
1971	15,711,211	31.17	+ 40.75	281
1981	21,966,806	35.04	+ 39.82	276

Maharashtra is the most urbanized state in India and more than one third of its population lives in towns. This stands in sharp contrast to 16.59 per cent of its population living in towns, at the turn of the century. In fact, the population living in towns today is more than what the total population of Maharashtra was in 1911. Thus, in a space of seventy years (1911 to 1981), the urban population of Maharashtra has increased seven-fold. Of this period, the last two decades are particularly critical during which the urban population of the State doubled. Paradoxically, this enormous increase in urban population does not show a corresponding increase in the number of towns, which barely show an increase of 16 per cent over the last seventy years. Obviously, it is the growth of individual towns which is responsible for this stupendous increase in the urban population. This can be seen from the fact that more than half the total urban population of the State lives in the three large towns, viz. Greater Bombay, Pune and Nagpur, and Bombay alone accounts for over 40 per cent of Maharashtra's urban population.

The size distribution of towns

The Indian Census classifies towns according to their size into six categories.

T-16.2 *Different categories of towns and their population in 1981*

Maharashtra

Size class	No. of towns in 1981	Population of towns in the class	Percentage to total urban population	Population Variation (1971-1981) in different classes
I (1,00,000 or over)	25	16,527,985	75.24	+ 48.61
II (50,000—99,999)	20	1,306,566	5.95	+ 19.94
III (20,000—49,999)	81	2,390,103	10.88	+ 36.60
IV (10,000—19,999)	91	1,340,571	6.10	+ 5.59
V (5,000—9,999)	43	346,948	1.58	— 20.05
VI (below 5000)	16	54,633	0.25	+ 16.14
All classes	276	21,966,806	100	39.82

Though there are variations both in the number of towns and the percentage of urban population living in the towns of each category, a remarkable fact that emerges out of the analysis of data is the progressive diminution in the percentage of urban population living in towns with less than 50,000 population. This is not because the number of towns in the lower population groups has declined but because of a much higher growth in the number and population of larger towns. Today, three fourths of the State's urban population lives in towns of over 100,000, while the corresponding figure for 1961 was only 60 per cent. To that extent, the towns below 100,000 population have showed a decrease in their total population and also a fall in the population living in each category from II to VI. The vertical mobility to a higher class and the consequent decrease in the number of towns in a specific category may or may not be compensated, but what is certain is the decreasing share of population in the towns of lower categories. In a specific group, the towns that move to the next higher order do so after having reached the maximum in that group, whereas the new entrants from the lower rungs just reach the bottom of the higher order. Unless there is a larger number of settlements joining the rank of towns and the attendant upward mobility of each group, following increase in their population, the population in each group is bound to decline. Since, the number of towns has not increased during the last ten years, only the group with the largest population size benefits and continues to grow, and the group of smaller towns shrinks both in number and population in the absence of a corresponding addition from below. Thus, the increase in the urban population and the number of large towns is essentially because of the growth of towns—

T-16.3 *Number of towns and their shares of urban population in each category*

Year	I	II	III	IV	V	VI	Total
1961 (i) No. of Towns	12	15	47	89	88	15	266
(ii) % of urban population	60.49	9.12	13.00	11.17	5.65	0.32	100
1971	17	25	65	98	70	14	289
	6.75	11.07	11.71	8.79	3.39	0.3	100
1981	25	20	81	91	43	16	276
	75.25	5.95	10.88	6.10	1.58	0.25	100

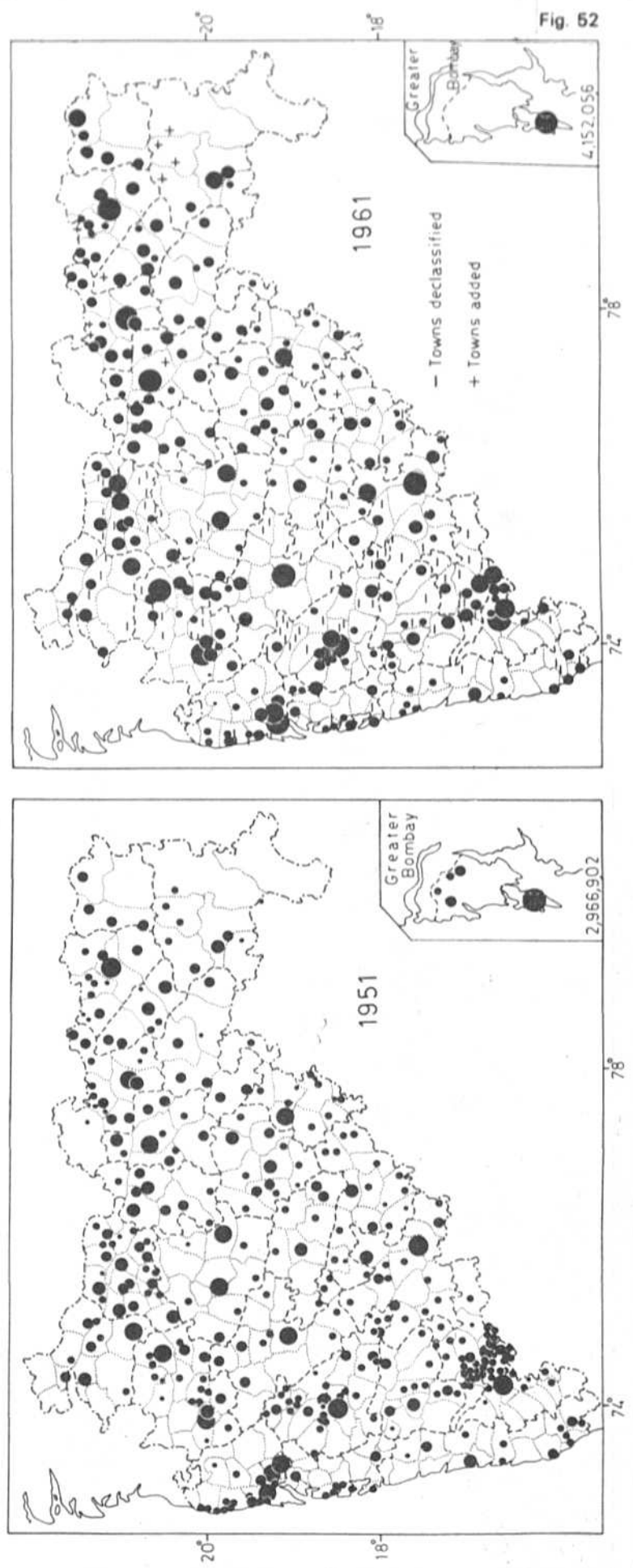
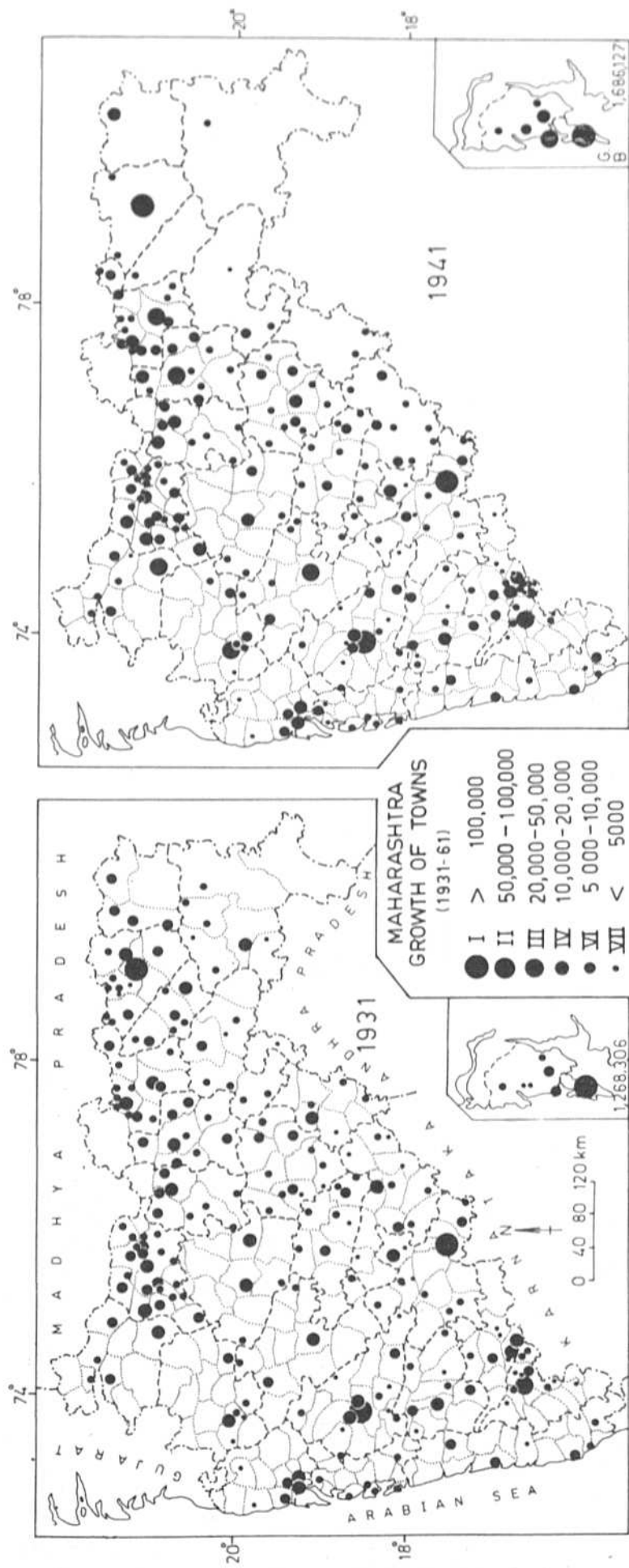
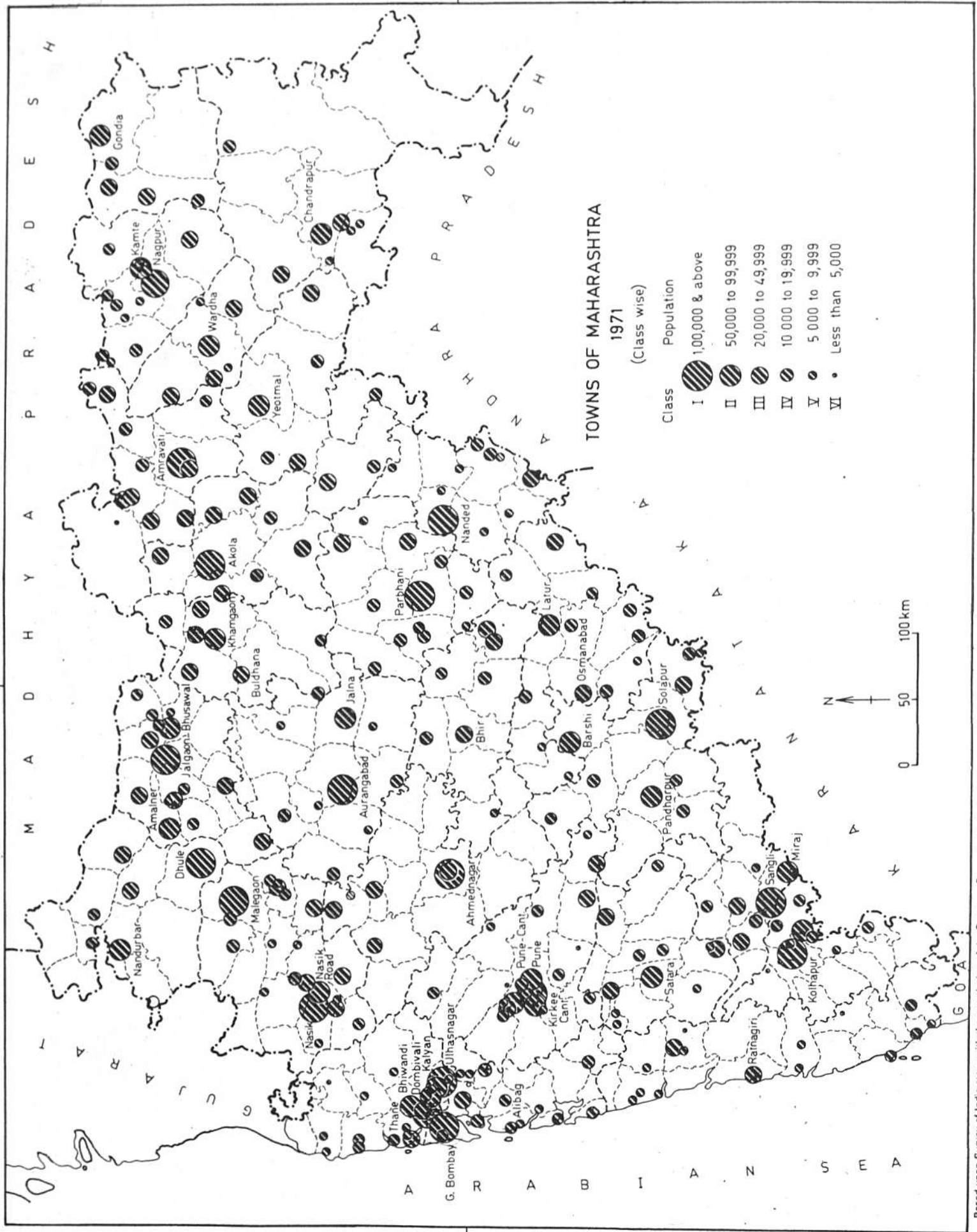


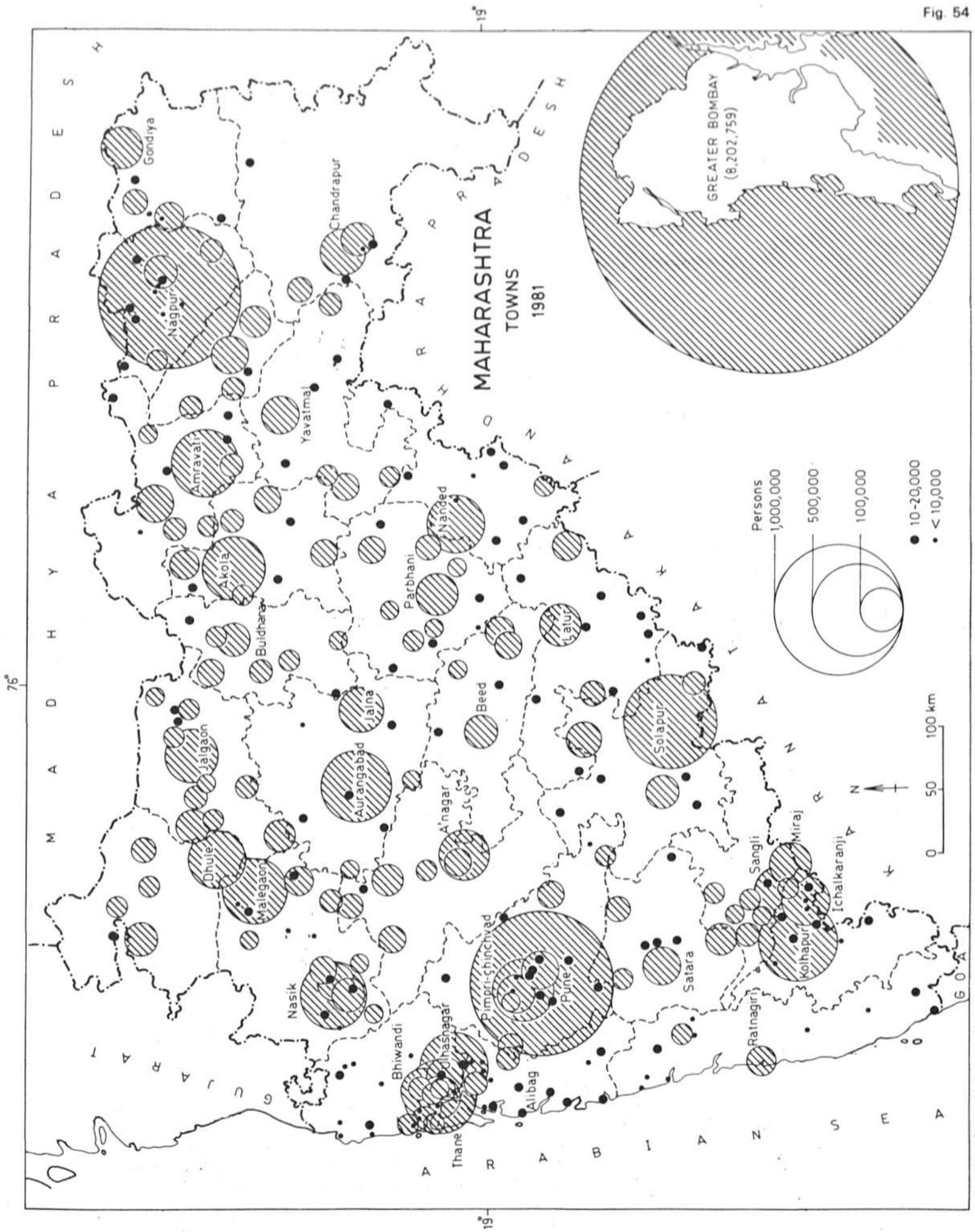
Fig. 52

Fig. 53



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 54



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

About two-thirds of the towns lie in the group 10,000 to 50,000 population. The towns with a population of less than 10,000 are rural service centres. This middle group 10,000—50,000 consists of towns having banking facilities, weekly markets, which are also the central places of some importance. The towns with a population of over 50,000 are either district headquarters, industrial centres, old towns on transport routes, religious places, or simple commercial marts. Most district headquarters have a population over 50,000, though a few like Osmanabad (38,958), Buldana (35,910) and Alibag (14,050) have a much smaller population. All these places do not have much of an economic base, and their size, like an overgrown village or a bazar town, results from a concentration of administrative offices.

The district headquarters could be divided into three distinct groups, large industrial centres, medium size industrial, commercial and administrative centres and exclusively administrative centres. In the first category, one can include Bombay, Thane, Pune and Nagpur. In the second category are included Nashik, Kolhapur, Aurangabad and Sangli. District headquarters like Amravati, Akola, Dhule, Nanded, Ahmadnagar and Jalgaon are, besides being seats of administration, commercial centres in their respective areas. Some district headquarters are purely administrative, like Yavatmal (89,073), Wardha (88,500), Satara (83,604) and Beed (80,286).

Location and distribution of towns in Maharashtra

All district headquarters and most taluka headquarters being towns, there appears a fair spread of towns all over Maharashtra. On a closer examination, one finds that there are areas of unusual concentration and areas which are virtually devoid of any towns. The forest covered eastern part of Chandrapur, the dissected slopes of Western Ghats which include the western parts of Kolhapur, Satara, Pune, Nashik and Dhule districts and the dry core of Maharashtra, comprising Ahmadnagar, Aurangabad and parts of Satara and Solapur show a relative paucity of towns. Of the 14 talukas of Ahmadnagar, eight do not have even a single town. The perpetually dry Shrigonda, Parner, Karjat, Jamkhed, Pathardi, Shegaon, Nevasa and Rahuri talukas of Ahmadnagar have so far not received any impetus to develop an urban base. This dry core of Maharashtra, spreading over Ahmadnagar, Aurangabad, part of Solapur, Beed and Jalna district, has perpetually suffered from scarcity and there is hardly any non-agricultural economic activity that could promote the development of towns. Equally devoid of urban settlements is the Sahyadrian crestline and the stretch of land extending from the foot of the Western Ghats scarp westward. A low density of population, absence of any industries and poor agriculture have combined to work as a disincentive against population agglomeration and growth of towns in certain areas of the State.

While some parts have not witnessed any noticeable level of urbanization, certain favoured areas have more than their share of urban population. A high level of urbanization presents itself in the form of town clusters and linear urban belts. Principally, there are two main alignments of towns in the State.

- (1) Bombay-Thane-Pune-Kolhapur-Sangli belt strung along the Bombay-Bangalore highway.
- (2) Nashik-Malegaon-Dhule-Bhusaval belt.

Bombay-Thane-Pune-Kolhapur belt

This is by far the most urbanized area in the State. The Greater Bombay Municipal Corporation with the adjacent towns and urban agglomeration like Thane, Dombivli, Kalyan, Ambarnath and Ulhasnagar, accounts for half the urban population of the State. The area extending from Bombay right upto the foot of the Western Ghats is a scene of intense economic activity and forms the industrial hub of Maharashtra. Thus from Bombay to Ulhasnagar, a distance of less than 80 km, there are 5 class I towns, with a large number of small towns and still smaller settlements strung along the railways and the highways, interstitial space being filled up with growing nuclei of settlements. This is also the commuting zone, pulsating with daily flow and ebb of traffic.

Up on the plateau, the urban ribbon continues with Lonavala, Pimpri-Chinchwad, a part of Pune agglomeration, and then Pune. During the sixties and the seventies of the present century, there was a substantial spill over of industries from Bombay. Initially, Pune had certain disadvantages, particularly the inadequacy of water and power. The commissioning of Koyna project and the integration of the entire grid of the State eliminated the bottleneck caused by power. Subsequently, the construction of Panshet dam on Mutha with increased capacity of the reservoir, and another dam on Pavna, ensured a regular supply of water to any new industrial venture. The result has been a rapid growth of industries

aligned along the Pune-Lonavala highway and railway both of which run almost parallel to each other. The industries have promoted the growth of existing settlements and induced the development of new towns. Thus from Pune to Dehu-road, a distance of about 40 km, there is a linear development packed with industries, commercial activities, ancillary workshops, hotels and a variety of shops, trading and transport agencies, all competing for space, with isolated residential areas, all conglomerated into one. The growth has been so fast that the State Government has constituted a separate municipality, called Pimpri-Chinchwad municipality, and there are proposals underway to make it a corporation. The urban belt continues further south from Pune, and intensifies itself in Panchganga basin with Kolhapur-Sangli cluster. Kolhapur and Sangli, the capitals of the two former princely states, are located in a rich agricultural area, dominated by sugarcane as the principal cash crop. The industrial landscape of the region, grafted on to the prosperous agricultural base, has set in a process of urbanization that has produced a cluster of towns in Kolhapur-Sangli region.

The entire urban belt (Bombay-Pune-Satara-Kolhapur) is characterized by a number of clusters. The Bombay-Thane-Ulhasnagar, Pune-Pimpri-Chinchwad, and Kolhapur-Sangli are the three important clusters of towns in the belt, of which the first two are highly industrialized. The Kolhapur cluster unlike the previous two is not so much the product of industrialization as of a bouncing agricultural economy with agro-based industries and important market centres. While Bombay is a world apart, Pune-Kolhapur belt has, for centuries, been an important axial region of Maharashtra. Pune, Satara and Kolhapur, all have been the seats of Maratha power at one time or the other. These traditional centres of Maratha administration and culture, supported by industries which have encouraged the influx of population in the region, have, in due course, developed a large functional base. The availability of many specialized goods and services has promoted the growth of many smaller towns in the vicinity and thus developed a cluster of towns.

Nashik-Malegaon-Bhusawal-Akola-Nagpur belt

There is a relative abundance of urban centres in this area. It is not suggested that the entire zone is studded with towns. By deciphering the alignment of towns in a linear pattern, one recognizes a relatively higher level of urbanization and an alignment of towns arranged along or close to the Bombay-Nagpur-Calcutta railways that traverse the entire subcontinent. While transport remains the motive force in the growth of a large number of towns, the agricultural prosperity of cotton and groundnut producing areas of Khandesh and Vidarbha is no less significant in the growth of towns in this zone. As sugarcane is the principal cash crop in Pune-Kolhapur belt, cotton is the main cash crop of Vidarbha. Akola, Amaravati, Buldana and Yavatmal are the highest producers of cotton in the State, and the agricultural landscape of Jalgaon and Dhule is dominated by groundnut. Thus, a number of centres trading in cotton and groundnut are also the sites of ginning factories and oil mills. The fertile Tapi valley has also supported a large number of small trading centres. In fact, the Nashik-Nagpur belt had an early start, and till the late fifties, was an important region with its excellent railways and road connections, fertile soil and the cash crops like cotton. The development of Nagpur, the erstwhile capital of former Central Provinces, owes much to the economic strength of its hinterland. The relative proximity to Bombay enjoyed by Nashik, Pune and Kolhapur has relegated this region into the background, but, of late, industries have started making their appearance afresh. The belt has three important clusters of towns.

- (i) Nashik cluster
- (ii) Bhusawal cluster
- (iii) Nagpur cluster

The Nashik Cluster.—Up on the plateau, overlooking the Thal Ghat saddle, and lying on Bombay-Calcutta route at a distance of 200 km. from Bombay, Nashik occupies a location corresponding to Pune. The city, besides being on the Bombay-Agra road, and Bombay-Calcutta route of central railways, lies on the bank of the river Godavari, which debouches from Western Ghats just 20 km to the north-west. The place had its association with the legendary Ramayana hero Ram, and is a pilgrimage of the Hindus. During the British period an artillery training centre developed at Deolali, not far from Nashik, and gave it an added importance. The establishment of the Government Security Press was a distinctive feature of the town. Of late, a number of industries have sprung up in Nashik and its neighbourhood. Agriculturally, the tract is fertile and receives the benefit of irrigation from Gangapur canal. The most important factory in the neighbourhood of the town is the manufacturing of MIG fighter bomber factory at Ozar started with Russian collaboration. It has an impact on the town to the extent that some people from the area are employed in it. A number of heavy engineering factories have also joined the industrial landscape of the town.

The Nashik agglomeration of town consists of Nashik, Deolali, Trimbak, Igatpuri, Nashik Road, Ozar, Pimpalgaon Baswant and Sinnar—all located not far from each other. Not too far is Rawalgaon, a small town with a sugar refinery and a manufacturing unit of confectionary. One of the largest urban centres in the area is Malegaon, about 100 km. from Nashik, specialized in the production of powerloom and handloom fabrics.

Another cluster of towns in the belt is centred around Bhusawal, a railway junction with a workshop and several other railway establishments. In fact, it started as a railway town. Jalgaon, Varangaon, Savada, Faizpur and Yawal are other towns in the vicinity. The entire railway track from Nashik to Nagpur has well spaced towns, culminating into Nagpur cluster. Nagpur agglomeration, though not as important as Pune industrially, has the same position in Eastern Maharashtra as Pune in Desh. With a population of over a million (1.2 million), the cluster includes Kamptee, Ramtek, Kalmeswar, Savner, Khapa and Mohapa, all situated within a radius of 50 to 60 km. from Nagpur.

While the two specific belts with strings of towns can be recognized, there is a fair spread of towns in the middle Godavari valley, in the districts of Nanded, Parbhani and Osmanabad. One of the major contrasts exhibited by Marathwada towns is their small size. Most towns have a population of less than 50,000. Devoid of any industrial base, they are only market centres with weekly markets and seasonal trading activities.

Functional characteristics of the towns in Maharashtra.—With variable resource-base and population, each town has a dominant function, and its functional characteristics may not be the same as that of another town. The variation in the functional nature of towns results from varying economic base both in nature and magnitude, the need and character of the hinterland, the factors responsible for the growth of a specific town, the process of its evolution, its size and finally its relative importance in the national set up.

In Maharashtra, over half the towns are unifunctional, mostly in the population group below 20,000. These are large villages, with people still owning land and depending on agriculture. The size of the settlement and the development of some central functions like a bank, High School or a college, a wholesale market, a weekly market, and a centre of collection of agricultural commodities, and in some cases, the office of a Panchayat Samiti, a Primary Health Centre, or a Block Development office that administers the supply of agricultural inputs to the farmers, give the settlement the status of a town. While there are exclusive agriculture-based towns with a very small service or commerce component, there are no such unifunctional towns in other functional categories, with the exception of those with industry as their dominant and almost only function.

The towns with an industrial base occur in all sizes ranging from Metropolitan Bombay to an exclusively industrial township like Ozar near Nashik. The first four towns of the State, Bombay, Pune, Nagpur and Solapur have a strong industrial base. Of these, Bombay is truly a multifunctional town with commerce, service, administration and other important components. In fact, Bombay is an epitome of all secondary, tertiary and even quaternary functions. Industry, trade, commerce and administration, health and education, all the urban functions are adequately represented in Bombay. Similar is the situation in Pune and Nagpur on a moderate scale. There are, nonetheless, industrial towns in lower population groups, whose principal base, the basic function, is industry. Malegaon, Bhiwandi, Ichalkaranji, Hinganghat, Khopoli, Ballarpur and Bhandara are all industrial towns. Very small industrial townships like Rasayani close to Bombay and Ozar near Nashik can also be classed as industrial. Between very large and very small industrial towns, there is a range of intermediate urban centres with populations over 100,000 like Sangli, Aurangabad and Ahmadnagar where the industries make their presence felt.

The large industrial centres have either emerged or grown to their present size because of certain advantages, like a coastal location, or ease of transport and distribution. The medium size or small industrial towns, on the other hand, grew as a result of ease of utilization of certain local raw material or skilled manpower. Ballarpur, a paper manufacturing town in the vicinity of forests, and scores of sugar producing towns in the sugarcane areas are examples of raw material utilization; and the handloom and powerloom industries at Malegaon and Solapur demonstrate the role of craftsmen in promoting an industry and, in turn, a town.

Service towns, with minimal component of industry and trade, are essentially administrative centres. Alibag, Chandrapur, Buldana and Satara are such towns. Most district headquarters combine administration with retail trade and other services, depending on their importance in the hierarchy of towns. Bhusawal and Daund appear more like transport towns. They had no viable base and much of the population in the early years depended on the railways for a regular job, daily wages, labour contracts and participation in vending and catering by the railways.

Unlike the higher order towns, the low order agriculture—based towns develop a distinctive character as a collection or a distribution centre of a specific commodity, may it be cotton, groundnut gur, chillies or onions. Baramati for gur, Khed and Manchar for onions, Akola for cotton, Latur for millets, Jalgaon for groundnuts and Chandrapur for timber are well known as centres of collection and shipment of these commodities. These places have a very important role to play in the agricultural economy of the area in which they are located. Devoid of free market competition, the trade in agricultural commodities has been exploited by small time traders in these centres. In most cases, the price line in these centres of collection has followed the trends in the metropolitan centres. Of late, the State Government has stepped in by setting up regulated markets with an intent to save the farmers from exploitation, offering advances against agricultural commodities and stalling distress sale on the part of needy village folks.

A few religious towns like Pandharpur in Solapur district; Tuljapur in Osmanabad district; Alandi, Dehu, Jejuri in Pune district; Kolhapur; Paithan in Aurangabad district have, in no small measure, gained in importance because of their religious base. The annual congregation at Pandharpur is so large, that many of the shopkeepers prepare for the event for months together. With the temple of Lord Vithoba the place exudes an air of divinity and the pilgrims, particularly those following the devotional cult, visit the temple all the year round.

Most towns in Maharashtra, as anywhere else in India, are unplanned and have grown haphazardly.

□ □

CHAPTER XVII

REGIONS OF MAHARASHTRA

A large region like the State of Maharashtra, represents an assemblage of diverse physical and cultural elements which have hardly fused into a homogeneous whole, and but for the commonality of language which has formed the basis of the states in India, the change in the landscape, the economy and the people from one part of the State to the other is not only perceptible but even striking. The landscapes of Konkan and Central Maharashtra are a world apart. The metropolitan culture of Bombay does not give even an inkling of the fact that less than two hundred kilometres away, in the hinterland live the tribal communities in their ramshackle huts, in the midst of forests and hills, practising shifting cultivation. The brahminical culture of Pune and the tribal culture of Gadchiroli, or the fertile and irrigated crescent of Panchganga river and the parched lands of Marathwada are hardly comparable. Added to these topographic and socio-economic contrasts, are the inter-state transitional areas where the bilingualism emerges as a major trait and the inhabitants take a more liberal view of things. These contrasts require that the areal reality of the land and life be examined, parcel by parcel, and not be lumped into one. The need for regionalization, regardless of a discipline, emerges out of the compulsion for a closer look to understand the spatial interaction, and above all the regional nuances, better. Without attempting an exercise in regionalization, it will be appropriate to examine and discuss the interaction of physical and human resources, the resulting landscapes, and the areal organization of human activities. The people of Maharashtra traditionally divided the State, more on the basis of history and topographic situations than anything else. Thus, Konkan, 'Desh', Marathwada, Khandesh and Vidarbha are the five principal units of Maharashtra. 'Desh' is also called Western Maharashtra in modern times. These five divisions emphasize the location and the past history of these units. Except for Konkan, which is a coastal strip and does not carry a historical bias, the nomenclature of the rest of the units suggests their medieval history. Marathwada was till the year of independence a part of Nizam State, largely inhabited by Marathi speaking people, in contrast to Telangana, which was the Telugu speaking eastern or south-eastern half of the erstwhile Hyderabad State. Vidarbha was the Marathi speaking area of the former Madhya Pradesh State, consisting of eight districts. It has still retained its entity as a socio-political unit. The districts of Dhulia and Jalgaon, once ruled by 'Khans', a vassal to the Nizam, are together known as Khandesh. The western districts of upland Maharashtra, stretching along the eastern flank of Sahyadris are known as 'Desh' distinct from 'Mawal', the dissected offshoots of the Sahyadri, east of the Western Ghats divide. These units are so firmly entrenched in the lingo and the layman's idea of Maharashtra that it is difficult to substitute them. The recent developments in agriculture and industries, growth of towns and the network of transport, would require a more elaborate regionalization that would have for its basis, not only the historical antecedents but also climate, topography, agriculture, industries, people and the entire gamut of socio-economic attributes that form a region. Thus, entire Konkan and Vidarbha have to be seen in the framework of recent developments. The old conventional units can be resolved in sub-units for this purpose.

Regions of Maharashtra

- | | | |
|--------------|----|---|
| (1) Konkan | .. | (1) Bombay region (North Konkan region) |
| | | (2) Middle Konkan |
| | | (3) South Konkan |
| (2) Sahyadri | .. | |
| (3) Mawal | .. | |
| (4) Desh | .. | (1) Upper Godavari Pravara basin |
| | | (2) The Ahmadnagar Plateau |
| | | (3) Upper Bhima basin |
| | | (4) Middle Bhima and Sina basin |
| | | (5) Nira basin |
| | | (6) Upper Krishna basin |
| | | (7) Panchganga basin |

Regions of Maharashtra—contd.

- | | |
|----------------|---|
| (5) Marathwada | .. (1) The Ajanta plateau
(2) The Middle Godavari basin
(3) The Manjra plateau
(4) The Middle Godavari-Purna Dudhna and Sindhphana basin |
| (6) Khandesh | .. (1) The Tapi trough
(2) Purna basin
(3) Melghat plateau |
| (7) Vidarbha | .. (1) Wardha-Wainganga-Penganga basin
(2) Satmala plateau
(3) Ahiri upland |

The Konkan

The Coastal lowland and the plateau confined between the Sahyadrian scarp and the Arabian Sea coast is traditionally known as Konkan. The region extends from south of Damanganga river in the north to Goa in the south and includes the entire coastal strip of Maharashtra extending over a length of 500 km. with a variable width of 40 to 50 km. It consists of 5 districts, viz. Thane, Bombay, Kolaba (now called Raigad), Ratnagiri and a newly formed district Sindhudurg, the last one being the five southern talukas of Ratnagiri, recently given the status of a district. The inclusion of Goa in Konkan raises many questions, since Goa is a separate state administered by the Central Government.

Here, one is concerned with that part of Konkan which is in Maharashtra. This longitudinal coastal strip, despite apparent regional contrasts possesses certain unifying characteristics reflected in its coastal location, separation from the upland Maharashtra by the Sahyadrian divide and a formidable west facing scarp, a drainage characterized by west flowing streams, rugged and often forested hills, heavy rainfall and an agricultural economy in which subsistence farming is dominated by rice, the staple food of the people. The development of Bombay during the last 150 years has created an oasis of prosperity, and carved out a region of its own, completely metamorphosed with its industries, trade, concentration of population and modern transport, and other social infrastructure. Thus, it no longer fits in Konkan that still awaits developments, and has been accorded a separate place in the scheme of regionalization.

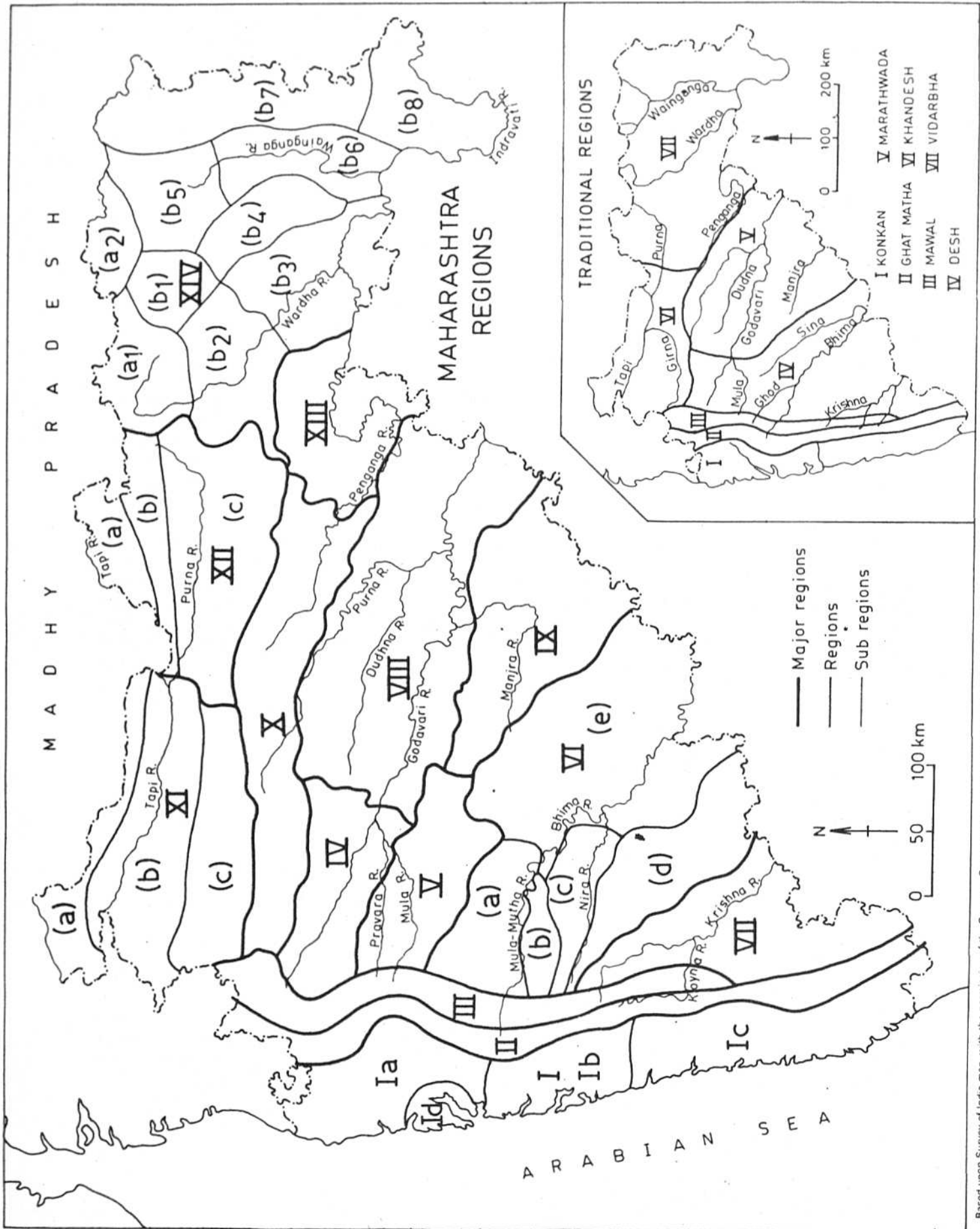
For convenience one may divide Konkan into—

- (1) North Konkan and Bombay region.
- (2) Middle Konkan.
- (3) South Konkan.

The North Konkan region.—The physico-cultural unit that could be defined as North Konkan is now dominated by the metropolitan Centre of Bombay and one is tempted to call it Bombay region. The latter nomenclature, however, would not be justified, as between the Western Ghats and the Coast, there are forested plateaus, well cultivated narrow riverine plains and valleys and low mountain ranges which have yet to experience the impact of Bombay. The urban influence radiating from Bombay has penetrated the hinterland linearly along the arteries of transport and is visibly confined to what is known as the Metropolitan region. A large area west of the Ghats presents the old world scene of forested and rugged terrain, a tribal population and a primitive subsistence farming. Thus, it will be appropriate to divide north Konkan into a number of sub-regions with their own physical and economic characteristics. The following sub-regions are recognizable:—

- (1) The foot hills of the Western Ghats
- (2) The riverine plains
- (3) The North Konkan Coastal range
- (4) The Coastal plains
- (5) The Bombay Metropolitan region.

Fig. 55



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

REGIONS OF MAHARASHTRA

- I. Konkan
 - (a) North Konkan
 - (b) Middle Konkan
 - (c) South Konkan
 - (d) Bombay Metropolitan Region
- II. Sahyadri
- III. Mawal
- IV. Upper Godavari-Pravara basin
- V. Ahmadnagar-Balaghat plateau
- VI. Bhima basin
 - (a) Upper Bhima basin—proper Pune region
 - (b) Saswad plateau
 - (c) Nira basin
 - (d) Mahadev Khanapur-Jath Plateau
 - (e) Lower Bhima-Sinha valley
- VII. Krishna valley
- VIII. Middle Godavari valley
- IX. Manjra plateau
- X. Ajanta-Aurangabad-Jalna plateau
- XI. Tapi trough
 - (a) The Satpudas
 - (b) Tapi trough proper
 - (c) Girna plateau
- XII. Purna basin
 - (a) Gawilgarh hills
 - (b) The Piedmont
 - (c) Purna plain proper
- XIII. Penganga-Kinwat hill complex
- XIV. Wardha-Wainganga basin
 - (a) Northern border upland
 1. Arvi upland
 2. Ramtek upland
 - (b) Wardha-Wainganga plain
 1. Nagpur plain
 2. Upper Wardha plain
 3. Lower Wardha plain
 4. Wardha-Wainganga divide
 5. Upper Wainganga plain
 6. Lower Wainganga plain
 7. Pranhita-Godavari-Indravati loop
 8. The Eastern Hills

} **Desh**

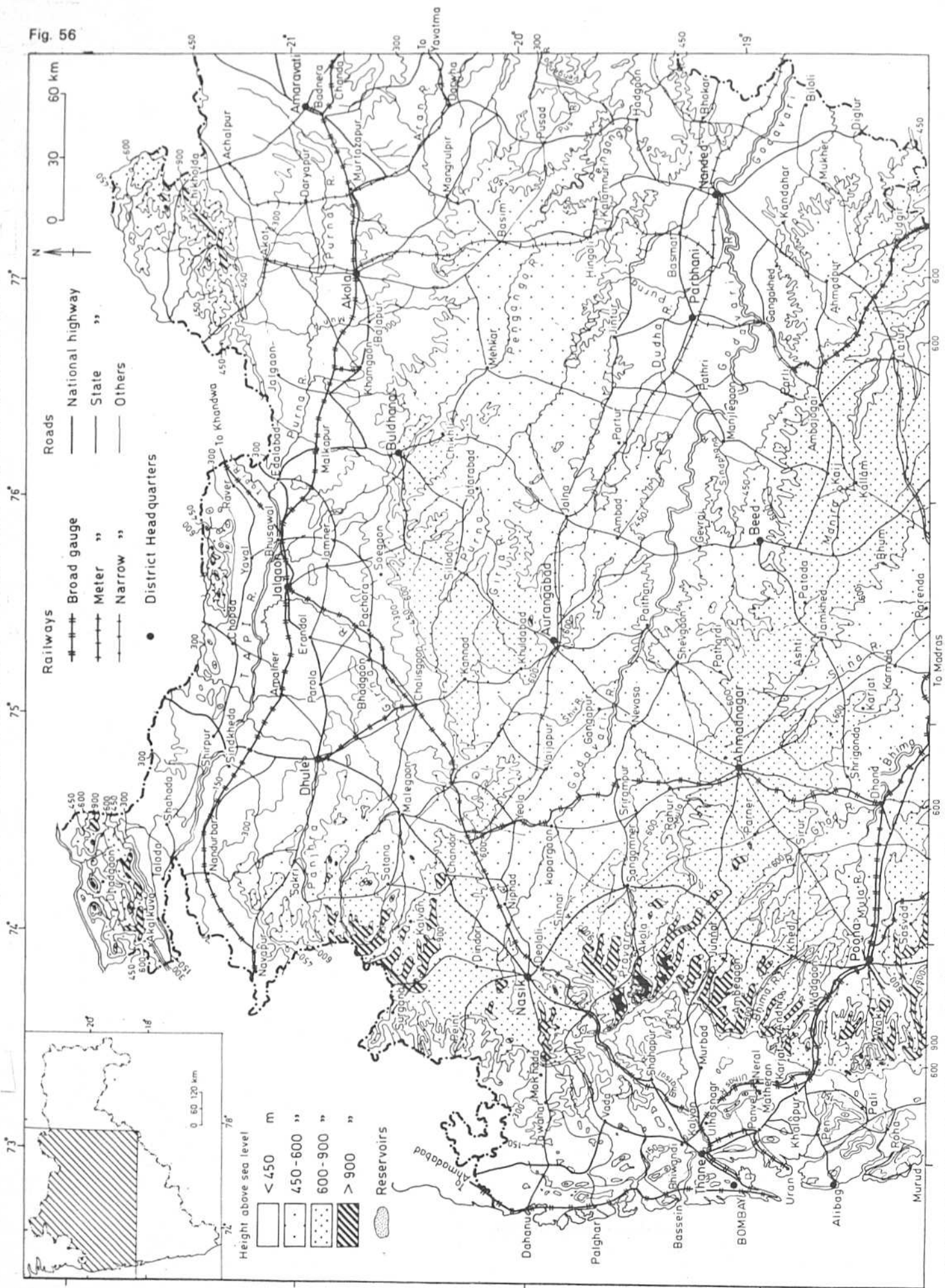
} **Marathwada**

} **Khandesh**

} **Vidarbha**

Fig. 56

NORTH KONKAN, TAPI VALLEY, UPPER & MIDDLE GODAVARI & UPPER BHIMA VALLEY



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The foot hills of the Western Ghats.—Down the steep descent of the Western Ghat escarpment are the foot hills, either detached and forming outliers, or close to the base of the escarpment making an assemblage of low hills. Sometimes, these foot hills take the form of plateaus presenting the appearance of a planation surface. The Jawhar—Mokhada—Peint plateau at a height of 350 m ASL falls in this category. This 350 metres surface, juxtaposed to the Western Ghat in the northern part of North-Konkan, has its extension in Gujarat where it is known as Dangs forest. Even in Maharashtra, the area is forested and presents some of the best moist deciduous forests of the State. The Peint taluka of Nashik and the Mokhada and Jawhar talukas of Thane district occupy this mid-altitude plateau. Abounding in forests; these are the strongholds of tribal population. With a rainfall exceeding 1500 mm and a terrain not quite suitable for cultivation, the area is given to forests. The plateau is dissected in the north by the headwaters of the tributaries of Par and Damanganga, both of which traverse the coastal lowland of Gujarat before joining the sea, and further south by the tributaries of Vaitarna and Tansa. The Jawhar plateau is relatively better preserved.

Compressed between the Western Ghat escarpment and the coastal plain, the foot hills are the home of the tribal communities, some of which, notably the Warlis, have even migrated to the coast. The Katkaris (Kathkaris) work as agricultural labour, and very occasionally they follow their traditional occupation of distilling the Kath wood (*Acacia Catechu*) to make Khair. The Thakurs living in the fastness of the Jungles, which have been gradually depleted, practise farming in small patches of land. The region with its heavy rainfall is a source of water supply to Bombay. Rivers like Vaitarna and Tansa have been impounded and reservoirs developed to provide year round water to Bombay, 75 to 100 km away. Vaitarna reservoir also carries a hydroelectric station generating some electricity. The area is picturesque with its forests, hills and dales and a tribal population which was disturbed only by the forest department. The occupation of the tribal people has been to distil *Kath* from *Acacia Catechu* (Khair) (and so the name Kathkari), engage themselves in forestry, subsistence farming and collection of Jungle produce. The largest tribal group is the 'Warlis' followed by Thakurs and Kathkaris.

The entire tribal belt in Thane district lives under the shadow of Bombay. Like rainshadow, this is an economic—shadow area, so close to Bombay but so primitive and so remote from development. The juxtaposition of an extremely poor and underdeveloped region with the opulence of Bombay shows that unlike pressure gradient which induces equalization of pressure by flow of currents, the prosperity gradient is an ineffective force, and tends to increase with ever increasing concentration of economic activity in a developed area. Equally ironical is the fact that the transport routes seem to have in no way influenced the development of the foot hill region. Transport as an economic activity, one may observe, is point-oriented and not area-oriented. It is a pre-requisite, but by itself does not bring development. All the transport routes traversing the area have not been able to induce any development.

Despite the difficulty of terrain, the forests in the area have, of late, been, subjected to excessive exploitation both legal and illegal. Besides felling of trees, preparation of charcoal has brought devastation to the area. There are a few roads that traverse the region, besides the Bombay-Agra road and Bombay-Calcutta Central Railway, which following a north-easterly course traverse the Western Ghats through Thal Ghat Pass. Jawhar, Mokhada, Khodala and Khardi are noticeable places commanding a centrality, having some shops and minor services.

The Kalyan-Nashik tract is very scenic, and still retains the charm of a hill country. The foot hill country is crossed by roads leading up the plateau at a number of places. Two routes traverse the hills from Gujarat. One from Bulsar via Dharmpur enters Dangs and crosses the Gujarat-Maharashtra border at Saputara, while the other road starting from Pardi reaches Nashik via Peint. The third route starting from Dahanu on the coast links Jawhar, Mokhada and Trimbak to Nashik. Bombay-Bhiwandi-Wada-Mokhada, Bombay-Bhiwandi-Khardi-Igatpuri-Nashik, Bombay-Kalyan-Saralgaon-Ottur and Bombay-Panvel-Khopoli-Lonavala-Pune are other routes. Of these, the route to Pune via Borghat (Lonavala) negotiates the steepest climb. From north to south, Peint, Jawhar, Khodala, Khardi and Saralgaon are the important stations in the foot hill zone.

The Riverine plains.—West of the foot hill zone are a number of linear plains aligned with Ulhas, Kalu, Bhatsai, Tansa, Vaitarna and Pinjal rivers. While the first three of these converge at Kalyan and join the Thane-Kalyan creek, the Tansa and the Vaitarna join the sea north of Dahisar. An interesting aspect of the course of Vaitarna is its north-south flow for about 50 km. between the two parallel coastal ranges, after cutting across one of these ranges at right angle. While apparently it appears a case of antecedence, the relative stability of the trap does not rule out the control of lineaments guiding the river first to flow transverse and then parallel to the Coastal ranges.

The Ulhas plain is remarkably flat and uniformly covered with brown silt, a product of weathering from the adjacent hill sides. The river Ulhas seldom, if ever, spills over its channel and appears unrelated to the large plain. A marine planation surface in early quaternary, covered with the silt brought by soil creep from the hill sides in a subsequent phase, is the most probable answer to the origin of this plain. The plains grow rice and a second crop in part of the land with the help of some locally available irrigation device, a pump or occasionally a minor irrigation project in the vicinity. Dearth of irrigation facilities has retarded market gardening in these plains, except in parts close to Bombay. *Wal*, a kind of pulse, is an important second crop. Ragi is the common crop on the hill slopes.

Most of the minor irrigation projects are in Bassein taluka, where Bhatane is the largest project with a command area of 283 hectares. These irrigation projects are in the form of dams across non-perennial streams, and no project has a command area of more than 300 hectares.

The plains are important from the point of view of communication, and most routes, both roads and railways, have followed the valleys to reach up the plateau. The agricultural base coupled with the availability of water from the river or from the wells in the valleys attracted early settlements many of which still remain without any spectacular development unless they happen to be on the main transport routes in which case, they have developed into a dormitory suburb or an industrial suburban centre. Karjat, Ambarnath, Kalyan and Panvel, all strung along Bombay-Pune railroad, have grown substantially, and Ambarnath and Kalyan have become the two important industrial centres in the metropolitan region of Bombay. Bhiwandi, another settlement on Bombay-Agra road, 15 km. north of Kalyan, has become an important handloom and powerloom centre. The coastal riverine plains have made it easier for the Bombay Metropolitan Authority to plan and regulate the growth of Bombay utilizing the plains for the location of industries and residential areas and leaving the hills and forests as scenic spots and recreational grounds.

It must be mentioned that eight tahsils (Bassein, Bhiwandi, Kalyan, Thana, Karjat, Panvel, Uran and Khalapur) are already included in the metropolitan region of Bombay, and are experiencing a rapid transformation of their rural landscape.

The Coastal Ranges.—The Coastal ranges, aligned north-south, particularly those north of Greater Bombay, are forested. Their role can be seen in a relatively higher rainfall at Dahanu and Palghar and an adverse effect on the east-west alignment of transport routes. The extension of the coastal ranges to the south on the Salsette island in Greater Bombay has been utilized for a green zone, converting the hilly forested area into a national park. Matheran, an outlier of the Western Ghats with an altitude of more than 700 m ASL, is a small hill station, and being close to Bombay attracts a crowd of holiday makers on the weekends. Not connected by a motorable road, and linked with the main Central Railway line by a light gauge railway line that operates only from October to May, the place still retains its natural beauty and offers relief from the hurry and bustle of Bombay.

The Coastal plain.—A fifteen to twenty kilometre wide coastal strip, north of Bombay, lying in its immediate hinterland, is an important sub-region of north Konkan. This coastal strip traversed all along by Bombay-Delhi line of Western railway and the national highway number eight which runs between Bombay and Ahmedabad, is a scene of intensive garden farming, besides the growing of rice. The sub-region enjoying the advantages of a very effective transport and a close link with Bombay, carries the imprint of the influence of Bombay, both in its primary economic activities and the occupational structure of its population. One encounters 'chikoo' and mango gardens, coconut groves and dairy farms all marketing their goods in Bombay. Being on the border of the forested hilly areas inhabited by tribal population, many large settlements work as contact towns and market centres, particularly for the tribal folks who visit these places to sell wood or other forest produce and buy goods of daily consumption. Timber trade is important, and Dahanu, Boisar and Palghar are important timber marketing centres on the Western Railway. Being the northernmost part of Maharashtra, contiguous to Gujarat, the area is inhabited by a large number of Gujarati traders. The coastal hamlets inhabited by 'Son Kolis', a community of fishermen, engage in fishing and send their daily catch to Bombay. Besides Son Kolis, Kolimahars also engage in fishing in the sea. The menfolk leave their coastal hamlets in the evening and return next morning. The sorting and grading of the fish is done by the womenfolk, who dominate the processing and marketing of fish in and around Bombay.

The Bombay Metropolitan Region is discussed in a separate chapter.

The Middle Konkan

Part of Konkan between the river Patalganga in the north and Savitri in the south is considered as Middle Konkan. The region largely coincides with Raigad district, formerly known as Kolaba district, named after the hill fort and the seat of the Maratha ruler Shivaji, who was crowned here and assumed the title of 'Chhatrapati'. It is distinguished from South Konkan by a relatively more open and flat topography, absence of a laterite plateau and proximity to Bombay. Also the level of development and the agricultural prosperity in middle Konkan is higher than south Konkan.

Equally divided into two halves by the river Kundalika, this narrow coastal region is a complex of forest covered hills, coastal plains, and the tidal creeks fringed with marshes and river plains, not a few of them fault line oriented. The important rivers, Patalganga, Amba, Kundalika and Kal, the last one a tributary of Savitri, present a drainage network that provides unmistakable signs of adaptation to structure. All these rivers make elbow bends in their courses. Amba makes an acute elbow near Nagothana and then follows a straight north-west course. From Nagothana to the sea, so straight is the course that a lineament can be easily spotted out. Kal, another river follows a north-south course, discordant to the grain of the country. In fact, a major lineament starting from the mouth of Amba and running south-eastward can be traced for more than 150 km.

The plains close to the Sahyadri and drained by Amba and Kal are the tectonic depressions with a roughly north-south alignment and covered with a very thin veneer of alluvium or occasionally appearing as rock plains. Between the structural depressions close to the Sahyadri and the coastal plain, are the hills ranging from 300 to 500 m. in altitude. These include Matheran (766 m.), a circum denudation relict, and Narnala (469 m.), both north of Patalganga river, Manikgad (575 m.) shrouded in reserved forests, and Nira Dongar (569 m.). Most of these hills are residual and suggest a surface of planation at about 550 m. ASL. Their distribution militates against the idea of a huge fault with a down throw of Konkan. Deep weathering of these hills provides a weathered mantle that is brought by wash and creep and deposited on the riverine plains.

The coastal area has a plain in the north, the Alibag plain, and is dotted with coastal hills south of Kundalika. The Alibag plain, level, heavily cultivated, experiences in a considerable measure the impact of Bombay. All along the narrow river plains and creek heads, rice is the principal crop, and in heavier soils a second crop of 'Wal' is harvested. Coconut plantations and betel and arecanut orchards make their appearance on the fertile coastal stretches.

The northern part, close to Pen, has experienced industrialization and the area north of Alibag is soon going to have the largest fertilizer plant in the country. 'Khopoli' the most important industrial centre, produces paper and chemicals, besides having a brewery. Located on the Pune-Bombay road, just at the foot of the Western Ghats, the town is a resting place for the automobiles before they start their climb up the Ghats. Initially a small village, it has grown in strength because of the location of the Tata hydroelectric generating plant, and other industrial units. Extraction of bauxite from some hills is the only mining in the area. During the last twenty-five years, the State Government tried to encourage the growth of industries without much success. A large chemical plant near Roha in private sector and a few minor industries are all that have developed away from Bombay. Alibag, Pen and Khopoli in the north and Shrivardhan, Mahad and Murud in the south are the important places.

The irregular and hilly terrain has confined the cultivated land only to serpentine river plains and coastal flats. With less than 1/3 of the area under cultivation, agriculture, with rice as the principal crop, does not present a bright picture. The agricultural communities are Agris, Kunbis and Malis. Of these, 'Agris' besides cultivating the land, work on salt pans. Irrigation is highly localized, but a large linear batch along Kal river, irrigated from the tail waters of Bhira power-house is conspicuously green. The region has a tribal population consisting of Kolis, Thakurs and Katkaris which account for 9 per cent of the total population. Some of them, particularly the Thakurs, have adopted the life of plainsmen and have turned regular agriculturists profiting from the lands-to-the-tillers-Act of the Government of Maharashtra.

A sparse population with a density of 175 to the sq. km. lives in small hamlets and even individual huts. Alibag with a population of about 15,000 is a coastal settlement and headquarters of Raigad district. It has a beautiful beach, besides the famous historic fort called Kolaba fort which was the seat of Kanhoji Angre, the admiral of Shivaji. There are a number of historical places along the coast, of which Chaul and Revadanda, close to each other on the mouth of the river Kundalika, and Murud and Janjira fort just north of Rajapuri creek, are noteworthy. In the pre-independence days, part of the coastal territory was ruled by the Siddis and the impact of the Muslim rule in a small pocket is seen in the predominance of Muslim population around Murud.

The Bombay-Goa national highway bisects the region into two halves, with transverse routes leading to the coast and the upland, following the valleys. The highways cross the Western Ghats in this region only at three points, the Bombay-Pune-Bangalore (National Highway No. 4) crosses the mountains at Khandala, rising from Khopoli, and in the south, Mahad-Bhor and Mahad-Mahabaleshwar routes connect this part of Konkan with upland Maharashtra. Pen, Nagothana, Roha and Mahad are important places of which Mahad, a taluka headquarters and located on Savitri river, is by far the most important.

There are a few places of tourist attraction in the region besides the beaches of Alibag and Murud. Narnala, a forest covered hill, 12 km south of Panvel, on the Konkan Highway is a bird sanctuary, and Pali on the river Amba is a religious place with a hot spring in the vicinity. But the most important place is the hill fort of Raigad, the seat of Shivaji, the pride of a place in the history of Maharashtra, the theme of many literary writings in Marathi, from where Shivaji ruled his territory. Situated on an outlier, it has a strategic location and can oversee the Konkan and the Desh in the sweep of an eye. Between the Maharashtra plateau and the Raigad is Kal Nadi which has to be crossed to reach the place, and any movement of the enemy can be easily spotted out from the commanding heights of the fort. Located at a height of 864 m., the top of the small plateau is not easily accessible, and requires a few kilometres of steep climb to reach the top. The fort, to-day, lies in ruins, except for the fort wall which stands witness to the impenetrable fortification that must have existed during the reign of Shivaji. The formidable walls of the coronation hall, the quarters of *Ashta Pradhan*, the market place and the elephant shed can still be seen. Closeby is the *Samadhi* of Shivaji, and a statue installed recently to mark the 3rd Centenary of the coronation of the great ruler.

Almost due west from Raigad at a distance of 60 km., on the coast, is Shrivardhan, the birthplace of the first Peshwa, Balaji Vishwanath, with a crescent shaped beach and beautiful palm orchards. Not too far to the south is the Harihareshwar temple, supposedly the family deity of Peshwas and visited by people from the Desh even to-day.

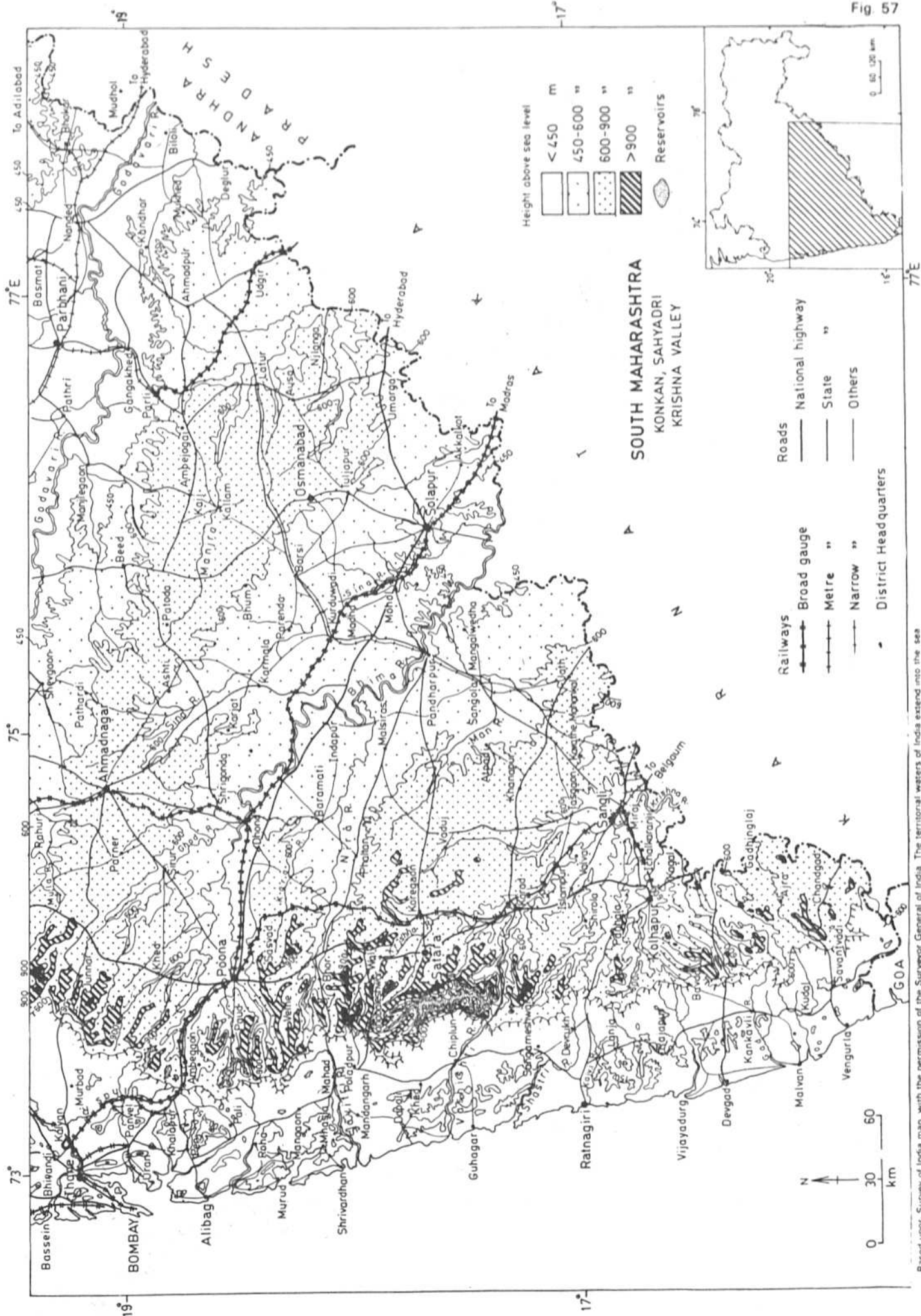
South Konkan

The coastal region of Konkan south of Savitri river is called here South Konkan. It differs from the Middle Konkan, by a thick and extensive cover of laterite, deeply entrenched drainage, a greater degree of inaccessibility and isolation and an overall economic poverty reflected in subsistence farming, a barren and parched lateritic plateau, and incessant migration of people to Bombay in search of jobs, a fact that has disturbed the sex ratio of the region with a dominance of women over men. The region coincides with Ratnagiri and Sindhudurg coastal districts. Longitudinally, the region can be divided into the piedmont plains at the foot of the Sahyadri, the lateritic plateau and the narrow coastal plain, a few hundred metres wide, abutted by the lateritic plateau. The entire region presents a desolate appearance of a parched plateau with short grasses which give it snowy appearance in October. It is laterite everywhere, all the way except in the valleys and on the shore.

The longitudinal piedmont plain, developed as a result of the recession of the Sahyadrian scarp, is a relatively low land with an average height of less than 200 m. above sea level. The weathering of the mountain fronts, their recession, and the amphitheatres made by the valley heads, have given rise to these plains, which are of recent origin. In fact, these plains are younger and genetically different from the lateritic plateau further west, and belong to a post lateritic phase. The weathered material brought from the mountains and spread in these plains, has led to the development of narrow enclosed basins associated with major west flowing streams. The Mahad plain on Savitri, Chiplun plain on Vashisti, Deorukh plain on Shastri and Kankavli plain on Gad belong to this category. Agriculturally, these plains are important, since the flat alluvial plains can grow paddy without much effort. Also, the coastal highway passing through these plains joins the towns like Mahad, Chiplun and Kankavli, which, in turn are significant as link towns joining Konkan with upland Maharashtra. The settlements in this zone have greater vitality and maintained a steady growth despite their manpower being syphoned off to Bombay.

Geomorphologically, these piedmont plains appear anomalous in the sense that broader flood plains are normally encountered as one moves downstream from the source of the river. In Konkan, it is just the contrary. Plains are observed at the foot of the mountains and as one moves westward, lateritic plateaus with deeply entrenched valleys are seen. The role of lithology is obvious, while the lateritic plateau has not permitted the process of valley widening to operate, the mountain recession in the eastern part has produced plains with a thick cover of weathered mantle, levelled by the rivers in an earlier phase, now appearing as terraces.

Fig 57



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

The lateritic plateau.—West of the zone of Piedmont plain is the lateritic plateau, with an average elevation of 150 to 200 m. The central rib of the plateau, from north to south, is slightly elevated. Much of South Konkan is covered with laterite to a thickness of 8 to 12 metres. The principal west flowing streams in the plateau are deeply entrenched, developing a relief of about 200 m. These V-shaped valleys owe their origin to the permeability of laterite on the one hand, and the possible tectonic upheaval on the other. The lateritic plateau, with its crust, having a pH of 5.5 to 6, does not support any vegetation, though paddy is sometimes grown in small shallow depressions having some soil accumulation. Cultivation is confined to the narrow, riverside terraces, deep down, close to the thalwegs. One finds at places quarries where the mining of laterite engages a few skilled people. The agricultural settlements line the deeply entrenched streams, a little above the waterline, with individual houses spread apart from each other in groves of trees, and invisible from the plateau tops. It is a subsistence farming, the agricultural produce barely enough to support the population of the village. Hathkhamba, Lanja, Rajapur, Shirgaon and Kudal are important market places in the region, besides being centres of retail trade distribution. In the extreme southern part, the area is underlain by Kaladgi series rocks which are exposed at many places between Phonda on the east and Devgad on the west and further south in Kudal in Malvan region the contact between the quartzite rocks and the overlying basalts has occasionally produced rapids and falls. The well known Kumbharwadi 21 m fall in Khoradi river, north of Shirgav and not more than 25 km, east of Devgad is in this zone. The region produces some of the best mangoes in the country grown on the valley side slopes, on the margins of the plateaus, and is the home of the famous Alphonso mangoes. The southern part of the region, occupied by Sawantwadi and Vengurla talukas, is more prosperous because of relatively flat land covered with alluvium which is suitable for cultivation. Besides agricultural productivity, the southern part is rich in forests and mineral resources. Lately, the plantation of rubber is being tried out in Sawantwadi taluka on an experimental basis. Sawantwadi, a former princely state is in the midst of greenery, linked directly with the upland Maharashtra across Amboli Ghat. The town (16,873—1981) facing the palace and arranged around a large tank is the last town, before one enters Goa, from Maharashtra.

The coastal strip.—From north to south, all along, the shoreline is broken by drowned river valleys, small river mouths inlets and creeks, and the most spectacular of all the cliffs and the beaches of Konkan. There is almost a regular sequence of promontories and embayments on the coast, the former with their bases covered with rock boulders and the latter usually presenting crescent shaped beaches. Facing the sea, the coastal region is the most developed part of Konkan. The settlements on the coast are either located on the low littoral terraces covered with an apron of alluvium brought by small rivers and rimmed on the seaward side by beaches. The settlements on the promontories, overlooking the creeks, are usually the fishing hamlets with small fishing crafts anchored along the water edge. Guhagar is a typical example of a coastal settlement depending largely on agriculture and plantation, whereas Dabhol, on the mouth of Vashisti, Jaigad on the mouth of Shastri, Ratnagiri on Kajvi and Malvan and Vengurla further south are fishing towns. Ratnagiri, being the district headquarters, its functional base is now enlarged and considerably modified, but fishing remains an important occupation of the people in the coastal area. The alluvium covered coastal terraces grow paddy and coconut with fruits like mangoes and jack-fruits. Backed by the lateritic plateau, the coastal strip is as undeveloped as any other region. Tourism is virtually unknown and the beautiful beaches remain deserted all the year round. Of late, fishing has been promoted by introducing mechanized crafts and giving incentive to deep sea fishing. Most of these large coastal settlements have also been defence establishments in the historical past with forts either on the mainland or on the offshore islands. Thus, Harnai, Dabhol, Jaigad, Ratnagiri, Vijaydurg, Devgad and Malvan, all have forts, though most of these forts are in a state of disrepair. Of these, the Sindhudurg fort, on an island, off Malvan, is most widely known and the new district of Sindhudurg is named after it.

Ratnagiri is the only town with a population of over 40,000. A district headquarter, the town is located on littoral flat backed by a 50 m. high cliff which has been transformed into a sloping approach to the town. The birth place of Lokmanya Tilak, a freedom fighter and a national leader of great veneration, the town is a stronghold of the Brahmin community. The main thoroughfare runs from the 50 m plateau to the sea, intersected by north-south parallel streets, called lower, middle and upper street. Built in laterite with tiled roofs, most houses are single storeyed. A small industrial estate in the vicinity has emerged with fruit and fish canning as the main industry.

South Konkan is relatively rich in minerals with reserves of iron, manganese and bauxite and a large quantity of silica. Iron ore occurs at Redi, Tak, Asola, Ajgaon, Shiroda and Nanos in Vengurla tahsil and Talavane, Gulduwe, Kinhala, Kauthani, Satarda, Sateli, Aros, Thakurwadi, Malewadi, Matond, Dabholi, Tendoli and Gale in Sawantwadi taluka. In the area around Redi, there is a reserve of 44 million tonnes of iron ore, though much of the ore is in the form of dust. The iron ore produced from this area amounts to roughly a million tonnes. Manganese also occurs in Sawantwadi and Vengurla talukas of Ratnagiri district.

The region, though having deposits of bauxite, is not so rich as Kolhapur region. Bauxite deposits occur at Supegaon, Kashid, Savroli, Usroli, Sarve, Rasthe, Dohane, Chikalgaon, Mahalpur, Borashi, Vanzoli and Karambalwadi in Murud tehsil, Gopalvat, Bhalgaony, Borhan, Tamewadi, Keljhar, and Khapri in Roha Tehsil and Wave, Bharkhed, Punerveli, Khujare, Devkul, Maneri, Adgaon, Velas, Saigaon Burwande, Wakalghar, Sekhade, Khandivli and Dongari in Shrivardhan tehsil. These bauxites are of high grade and contain 45 to 52 per cent aluminium oxide.

Besides, the above metallic minerals, silica sand, associated with Kaladgi quartzites occur in South Konkan.

Konkan is relatively poor in industries. Besides industries based on local raw materials, like fruit and fish canning and processing of cashewnuts, there are a few scattered industries. Of these, chemical industries at Roha, Mahad and Chiplun are noteworthy. There was a proposal, a few years ago, to set up an aluminium plant with locally produced bauxite or brought from nearby Kolhapur, but the proposal did not materialize, though with an energy base at Koyna, the largest hydroelectric power station, this could have been easily achieved.

The Development of Konkan.—With the poverty of agricultural resources, dissected and irregular terrain, poor soil and the perpetual migration of people to Bombay, the poverty of the region stares into the face of even a casual visitor. Prosperity cannot be superimposed from above, and has to be generated by making judicious use of local resources, gainfully employing the manpower and encouraging private investment by offering certain concessions or using public resources as matter of national priority, treating Konkan as a depressed region. The establishment of an agricultural university at Dapoli has hardly worked as a catalyst and can at best promote horticulture in areas which are otherwise barren or rocky. Though in itself important, that will not go too far. During the last decade, the Government has set up 'Konkan Development Corporation' with its office located close to Bombay. One fears that in the name of development, the Corporation may be developing the suburb of Bombay, with a blind eye to the stark reality of poverty-sticken south Konkan.

Two points usually mentioned at almost all seminars and discussions, and made in working papers, refer to the abundance of water and manpower in Konkan, besides horticulture which is ever recommended. While the practice of horticulture has much to commend, a high rainfall and manpower in themselves could not be of much avail. Agriculture in Konkan does not suffer from want of water, but from the non-availability of land. The people of Konkan are very hardworking and they have cultivated every inch of available land, but they certainly cannot change the thick lateritic cover into soil. One has to think in terms of industries with local resource base, like fishing and tourism, or of industries which are footloose and have the ability to develop anywhere, if manpower, energy resources and transport are assured.

Transport, no doubt, is a problem in Konkan, more than in any other part of Maharashtra. In the first place, Konkan being a linear strip, the usefulness of any transport route is limited. Secondly, the badly dissected land makes the laying of roads or for that matter any other line of transport a costly proposition. Heavy rainfall also makes for costly maintenance. To avoid the wide creeks and deep valleys, the Konkan highway follows a route 20 to 30 km. inland from the coast, whereas most of the towns, ports and major settlements are located on the coast, necessitating offsets from the main highway. The overall accessibility to settlements is poor and the situation becomes worse during the rainy season.

For the last few years, there is a talk about Konkan railway running all along from Bombay to Mangalore. South of Mangalore, there already exists the railway line till Kanyakumari, the tip of the Indian peninsula. The cost factor seems to have prevented the laying of the railways. The laying of this railways will certainly induce industrial development of the region, the same way as the developmet of Bombay-Pune, Bombay-Nashik or Bombay-Surat axial regions. The movement of industries from Bombay has taken place in all directions except towards Konkan, and this is attributed to unavailability of quick dependable and cheap transport.

The development of Konkan lies in generating employment by intensive industrialization, but the investment has to flow in from other parts of the State or the Country. Agriculture and horticulture offer limited prospects.

The Sahyadris.—The Sahyadri, also known as the Western Ghats, is the chain of mountains, extending from south of Tapi river in Gujarat to the tip of the peninsula, all along parallel to the coast and forming a physical as well as a cultural divide between the plateau and the coastal lowland. They are distinguished by their height, relief, mountainous character, heavy rainfall, forest cover and their location dominating Konkan and rising from it over a precipitous west-facing escarpment which preserves its continuity throughout its entire length. The term 'Western Ghats' was adopted by the British after 'Ghats', a word used in Maharashtra to refer to these mountains and was qualified with a prefix western to distinguish it from the Eastern Ghats.

The Sahyadris don't have a complex structure like the Himalayas, their most spectacular feature being the west facing 700 m. scarp. Lithologically, they are a part of the Lava plateau, the basalts having erupted during the Cretaceous and early Tertiary periods. Except for some small dips in the vicinity of Bombay, no folds or deformations are reported from the basaltic plateau. The Western Ghats are the undenuded rim of this plateau where the earliest rocks are 70 million years old. The relief and height of these mountains vary with the degree of dissection, entrenchment by the river, and the level of planation achieved. At their lowest, in the saddles, they have a height of 700 m., whereas some of the plateaus associated with the Ghats, like Mahabaleshwar attain a height of over 1500 m. From Konkan to Desh (West to East), the mountains present a formidable barrier and are traversed by roads and railways only at a few points.

The Western Ghats while bringing orographic rain to Konkan, effect a rain shadow area in 'Desh' leaving much of the central Maharashtra relatively dry. It must, however, be conceded that the heavy rainfall zone in the Sahyadris is also the source region of the major east flowing rivers, the principal ones being the Godavari, the Krishna, and the Cauvery. From north to south, some of the peaks and plateaus attaining an above average height are given below:—

1. Kalsubai peak	..	..	..	1646 m.
2. Harishchandra	..	..	..	1424 m.
3. Singi	..	..	..	1293 m.
4. Tamhini	..	..	..	1126 m.
5. Torna	..	..	..	1403 m.
6. Rajgad	..	..	..	1376 m.
7. Rareshwar	..	..	..	1373 m.
8. Mahabaleshwar	..	..	..	1438 m.

South of Mahabaleshwar, the height of Western Ghats in Maharashtra lingers around 1000 m, and often it is less. In situations where the rivers have reached the crestline by headward erosion, the height of the Ghats is lowered to 800 m. The passage from Konkan to the upland is difficult and the Ghats are crossed only at a few points. These passes, the saddles in the range, are also known as Ghats. From north to south, there are a number of such passes which provide the site for laying of roads and railways, linking the Coast with the upland. The most important of these passes are:—

1. Thal Ghat	..	..	Bombay-Nashik Road
2. Malsej Ghat	..	..	Bombay-Kalyan-Ottur
3. Bor Ghat	..	..	Bombay-Pune
4. Varandha Ghat	..	..	Mahad-Bhor-Pune
5. Rantondi Ghat	..	..	Mahad-Mahabaleshwar
6. Kumbharli Ghat	..	..	Chiplun-Karad
7. Amba Ghat	..	..	Ratnagiri-Kolhapur (via Malkapur)
8. Phonda Ghat	..	..	Devgad-Radhanagari-Kolhapur
9. Amboli Ghat	..	..	Vengurla-Sawantwadi-Nipani

Most of these passes are at a height of about 700 m., except Rantondi Ghat where the plateau of Mahabaleshwar has to be traversed while going up from Konkan to 'Desh'.

The Sahyadris present the heaviest rainfall zone of Maharashtra, and almost everywhere the mountains receive more than 2000 mm. of rain, with some higher parts receiving even more than 5000 mm. Lonavala, Bhor, Mahabaleshwar and Amboli receive 4303, 955, 6226 and 7477 mm. of rains

annually. A high rainfall has, no doubt, generated the growth of forests which are not uniformly preserved in all parts. In the north, Surgana and Peint talukas of Nashik district have good moist deciduous forests, but further south the forests occur in patches, preserved only in less accessible areas like the plateaus of Bhimashankar and Mahabaleshwar, Koyna region and the vicinity of Amboli Ghat on the Maharashtra-Karnatak border. South of Mahabaleshwar, the Shivasagar lake occupying the longitudinal Koyna valley, and extending over a length of 65 km. above the dam site at Helwak, has effectively worked as barrier, cut down accessibility and prevented encroachment, thereby promoting the regeneration and growth of luxuriant forests west of Koyna reservoir. The Amboli-Ajra plateau almost on the border of Maharashtra and Karnatak has well preserved forests.

The northern part of the Sahyadris is largely inhabited by tribal communities like the Mahadeo-Koli, Katkaris, Thakurs and Warlis, all of whom are confined to Nashik, Ahmadnagar, Thane, Pune and Raigad districts. South of Mahabaleshwar, the encroachment from the 'Desh' is much deeper and the tribal population virtually disappears. Most of these tribal communities have partially taken to agriculture wherever land is available and follow settled occupations, having adopted the mores and codes of Hindu society. But, those not having any land, precariously hang on to the age old practice of shifting cultivation in patches and live off forests.

The forest clad emerald green Sahyadris were once teeming with wild life, but over the decades there has been a merciless devastation of both plant and animal life, with the result that even the gently inclined surfaces have become barren, used only by the tribal population during the monsoons for growing inferior millets. In place of forests, only the scattered bushes are found and the extensive rocky patches appear as scars in the landscape. The encroachment has followed the valleys which are presently the scenes of cultivation, creeping up the slopes. The forests are preserved only in areas which are either reserved by the forest department, yielding commercial timber or kept well conserved as is the case of Mahabaleshwar plateau. The utilization of water in the Sahyadris centres around the building of dams and reservoirs for irrigation and power generation. Usually, a reservoir east of the divide line serves as a storage for irrigation, but in a few cases the water is diverted to Konkan through tunnel and pipes for the generation of hydroelectricity. At present about 1/3 of the total power generated in the State comes from the hydel power stations located at the foot of Sahyadris. Similarly, the major irrigation projects in Western Maharashtra depend for their water supply on the heavy rainfall in the Sahyadris. One may term Sahyadris not only the backbone but even the lifeline of Maharashtra.

The generation of hydel power is confined only to a few sites depending on the feasibility of storage and the suitability of the power generating sites. From north to south, Vaitarna, Bhivpuri, Khopoli, Bhira, Koyna and Radhanagari are the sites where hydroelectricity is generated. Bhivpuri, Khopoli and Bhira, popularly known as the three sisters, are the power houses developed and run by Tatas (Tata Electrical Co.). In each case, the headwaters of the east flowing plateau rivers are impounded and the water is diverted to the foot of the scarpment in steel pipes over a head of 5-600 m. The largest installed capacity is possessed by Koyna hydroelectric project which consists of a dam across Koyna, a reservoir called Shivasagar, and a power house at the foot of the Western Ghats close to Chiplun. The Radhanagari project has a relatively small potential, and the generation of electricity is only at the dam site.

Being a zone of heavy rainfall, most of the major irrigation projects are located in Sahyadris. Most of the major rivers like Godavari, Bhima and Krishna and their tributaries have been dammed and storage developed for irrigation. The Gangapur dam on Godavari, the Darna dam on Darna river, a tributary of Godavari, and Bhandardara and Dnyaneshwar Sagar on Pravara and Mula respectively, the dams on Kukadi, and further south on Nira, Krishna, Warna and Bhogavati, all very effectively bring under irrigation a large acreage of land. Further east, there are major irrigation projects like Jayakwadi and Ujjani on Godavari and Bhima. Located as these two projects are in a relatively dry area, the source of water even for these reservoir is the Sahyadri with a rainfall of over 2-3000 mm, during the monsoon.

The Sahyadris offer some very attractive sites that are being developed as tourists resorts and hill stations. Deolali, Bhimashankar, Lonavala, Mahabaleshwar, Panhala, Gaganbawda, Radhanagari and Amboli are all perched on, or nestled in, the Sahyadris. Some of them like Singi, Bhimashankar (the place of Jyotirlinga) are sanctified by the deities holding out a religious appeal, while the others serve as hills stations and tourist resorts. Of late, Panhala, and Amboli have been developed as holiday resorts besides Mahabaleshwar which was developed during the British period as a hill station and continues to attract tourists even today.

In the narrow mountainous zone, there are no large settlements since there is no support base of agriculture. Small hamlets between the hill slopes and the streams, not too far from the water line, house a few families often of tribals who eke out a meagre living from the cultivation of narrow terraces and grow "nachani" and "warai" on the hill slopes. Important places include the taluka headquarters, located within a distance of 10 to 15 km, from of the divide line. Igatpuri, Junnar, Wadgaon, Paud, Velhe, Bhor, Wai, Satara, Patan, Malkapur, Panhala and Ajra are important settlements in the Piedmont zone of the Sahyadris, east of the divide, in the territory that is traditionally known as 'Mawal'. There are two major hill settlements in the area, one is Lonavala and the other Mahabaleshwar. Lonavala is a pass town located on Bombay-Pune rail road. Developed around a railway station of the same name, the settlement was in the early stages of its growth largely a railway colony with engineering and maintenance staff. The town remained virtually stagnant with some holiday cottages and a few hotels and the permanent residence of a few traders and Parsi families. During the sixties and seventies, it has experienced an unprecedented growth. Till 1941, the place had a population of about 10,000, but today, it has grown to over 35,000 and is showing signs of rapid growth. With a good shopping area, a few good hotels, and many more still emerging, the place is on its way to acquire the functions of a hill station, which it really is.

Mahabaleshwar, the forest covered lateritic plateau at a height of over 1400 m. in Satara district and 120 km from Pune, has a small settlement with a permanent population of about 8000, named after the God Mahabaleshwar, overlooking the valleys of Krishna, Savitri, Koyna and Venna. It commands a panoramic view of Konkan, and the awe-inspiring deep valleys carved in the basaltic plateau of the Deccan. The place being too rainy, humid and foggy during rains, has not been able to attract permanent settlers, but is thronged by tourists from October to June. The centre of the settlement, known as Malcolm Peth, after Sir Malcolm, the then Governor of Bombay Presidency, is formed by a shopping street. Away from the bazar area are many sprawling bungalows, amidst the greenery, belonging to Parsis who, it appears, monopolised the place and preserved its beauty. Not far, on the plateau, is old Mahabaleshwar, a settlement of antiquity with temples and priests. The plateau is covered with evergreen forests with stunted trees having *Jambul*, *Anjan*, *Pisa* and *Hirida* as the principal species. The place is known for its strawberry gardens and honey.

Mawal.—The eastern flank of the Sahyadris with their offshoots and intervening valleys, badlands and rivers, narrow intermontane plains and river terraces, over a width of about 40 km east of the divide, is known as Mawal. Though physiographically Mawal extends all along the length of Sahyadris, the term came to be applied exclusively to the dissected piedmont region of Pune district, where a taluka of the same name with its headquarters at Wadgaon (on Pune-Bombay rail route) exists. The term Mawal is currently not applied to the corresponding areas of Nashik, Ahmadnagar, Satara and Kolhapur districts. The region came into prominence during the reign of Shivaji because of its strategic importance. Studded with a large number of forts, the area was guarded by the local inhabitants, the Mawalas, a community fiercely loyal to Shivaji, and the retention, restoration and the control of the forts and the territory west of Pune, was achieved only with their help.

The region with its poor soil, dissected and rocky terrain and inadequate water is traditionally poor, inhabited largely by tribal communities. It might appear paradoxical, though it is true, that despite heavy rainfall in the Sahyadri, Mawal suffers from the paucity of water resource. The steeply inclined surfaces do not permit enough infiltration, and there is a perpetual seepage towards the main streams. Thus the wells do not always yield water. Cultivation of the valleys, is, therefore, confined to the rainy season.

The irrigation projects benefit only the fertile land further east, where flat lands predominate and even the canals are taken out from the pick-up weirs several kilometers downstream, leaving the narrow riverside plains in Mawal untouched. Rainfed rice in the valleys and *nachni* on the slopes are the main crops grown during the rainy period. Only such valleys as get the benefit of irrigation practise double cropping and raise winter crops. Dairying, despite being very uneconomical, is practised by individual farmers, who do not account for their labour input in the cost-benefit analysis of their business and get cash returns from the ready milk markets in urban centres like Nashik, Pune and Kolhapur.

Despite a low density of population with a poor economic base, the region has a very high density of settlements, small hamlets dotting the entire region. A limited acreage of cultivated land, confined to valley-side flats, is a serious constraint on the growth of the settlements. Small hamlets have developed

wherever some flat land is available and offers a semblance of opportunity for eking out a living. But, by and large, the villages live in poverty. With its water reservoirs, forests, forts, deep valleys and hilly terrain the area is rich in natural beauty and can well become a tourists paradise. The region not only has some of the most well known forts, like Lohgad, Visapur, Sinhgad, Torna, Rajgad, Ajinkyatara, Sajjangad and Panhala, but also a large number of lakes and wild life sanctuaries, as Sinhgad and Radhanagari.

Forests are the important resource of the region, though not much is left after years of exploitation. Once teeming with wild life, it is virtually depleted of it now. Even the tribal population once living off the natural resources of the region finds it difficult to survive. Access to the region is only along the valleys with strings of settlements, either engaged in farming or grazing. Growing of grass is a useful mode of farming. Though the return is poor, it is drought resistant and relatively immune to pests. The hill slopes used for grazing are set on fire every summer to destroy the old dry grass and its stubble, a practice that supposedly invigorates the growth of grass during the next monsoon.

Mawal, which should have been aesthetically the most beautiful landscape with its rivulets, forest clad slopes and a cool climate, is reduced to barrenness as a result of reckless cutting of trees, cultivation of gentle slopes accelerating erosion, and the grazing of the steeper slopes. All this has set in a process of hill slope erosion, gullying and the destruction of the scenery. Neither the supervision by the forest department nor the pressure of enlightened public opinion has been able to prevent felling of trees by tribal communities and the unscrupulous contractors. Interposed between the Peninsular block and the Arabian Sea Coast, the Western Ghats and Mawal have a number of settlements which control the routes between the plateau and Konkan, most important of them being Igatpuri, Junnar, Lonavala, Bhor, Wai, Patan, Malkapur and Radhanagari. The region has become a favourite haunt of graziers, particularly the Dhangars practising transhumance who enter the region with their herds of sheep after the monsoons recede and return to the drier parts of the plateau with the onset of monsoons. Collection of honey and other forest products and catching games, once the important occupation of the hill tribes, is no longer in vogue.

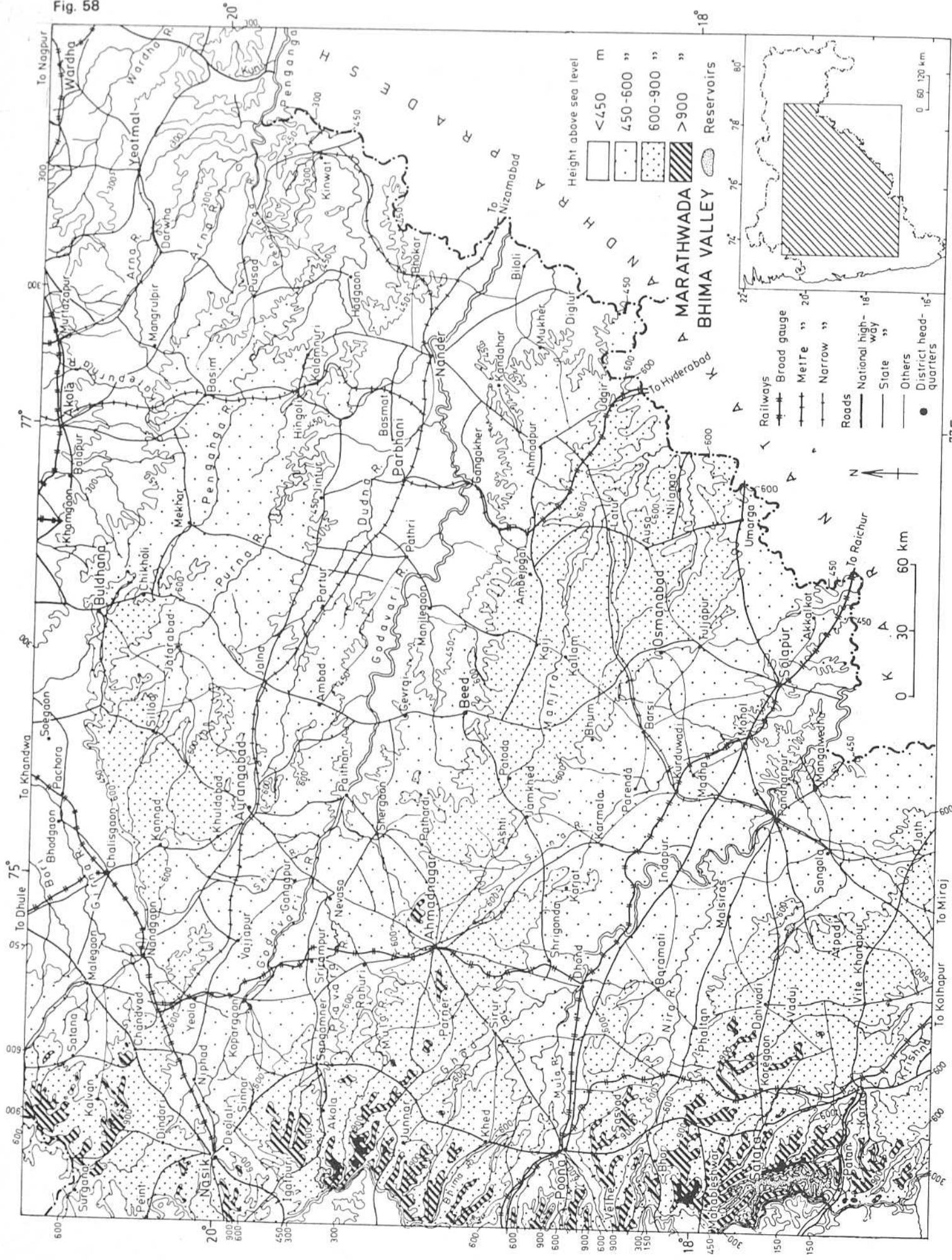
The most developed part of Mawal is the Pune-Lonavala tract, the Indrayani valley, where taking advantage of the efficient trunk routes and proximity to Bombay and Pune, a large number of industries have sprung up, and more are in the process of coming up. The rise of industries has meant conversion of very fertile agricultural land into non-agricultural uses, increase in the price of land, increase in the volume and density of traffic and growing congestion that is apparent from many small villages developing into suburban towns with their local railway stations, bazar streets, slums and unsanitary conditions. The process has moved linearly and not invaded other parts of Mawal. The land contiguous to the Sahyadris could be more profitably left as a green zone that could form the retreat and recreational ground for the agricultural population of the area further east.

The upper Godavari and Pravara basin

This region includes the area drained by Godavari river upstream from Ahmadnagar and Aurangabad, lying between Satmala hills and Ajanta plateau on the north and the Ahmadnagar-Balaghat plateau in the south. Godavari itself debouches from an offshoot of Sahyadri range, locally called Trimbak, 30 km west of Nashik. Much of this region lies above 450 m contour rising to the west and northwest and appears a shallow basin, with tributaries of Godavari joining from both sides, the more important ones viz. Darna, Pravara and Mula from the right. Since they descent from the Sahyadri, they are well replenished. Much of this region experiences a moderate rainfall of about 650 mm. Topographically, for about 75 km on either side of Godavari, the land is relatively flat, and the monotony of the basin is broken only by the offshoots of the Sahyadri on the west, and the outliers of Ajanta plateau and Aurangabad hills on the east. Being in the rain shadow area of the Western Ghats, the region suffers from inadequate rainfall. Nashik receives only 816 mm of rain but down the valley further east and south the rainfall tapers and places like Kopargaon, Shrirampur, Rahuri and Paithan receive less than 500 mm of rain.

The area around Nashik in the source region of Godavari, and further downstream, the river plains are fertile and agriculturally prosperous. These areas receive the benefit of irrigation from the upper Godavari canal, Gangapur dam, Pravara canal and Mula river canals. The eastern part of the region, north of Godavari suffers from aridity, and the absence of any irrigation project. In response to the irrigation facilities, the landuse and crop pattern have changed considerably, with a larger percentage of

Fig. 58



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

land given to cash crops, particularly sugarcane. Nashik district has the largest acreage of wheat in the State and the entire valley has an unusually high acreage under sugarcane. Nashik-Kopergaon-Shrirampur-Rahuri-Newasa-Shevgaon tract enjoys canal irrigation from Darna, Pravara and Mula rivers and is, over the decades, geared to the growing of sugarcane, and a large number of sugar factories have sprung up dotting the landscape. The outer margin of the basin, and particularly the area east of Godavari, still practises rainfed cultivation, and much of the land is still 'Jirayat' (dry) in contrast to the 'bagayat' of the right bank.

Nashik region is particularly known for its orchards and vineyards, and the irrigation from Gangapur dam led to an early introduction of wheat. The sugarcane landscape in the Kopergaon-Shrirampur region bristles with apparent agricultural prosperity. The sugar factories have not only enriched the peasantry and given employment to the landless people but also promoted a host of public utility institutions like hospitals, technical schools, colleges, besides a number ancillary industries that derive their support from these sugar factories. During the crushing season, the roadsides are dotted with thatched colonies of migrant labour engaged in cane harvest. Some of the central places in the area have become important centres of collection. Niphad, a place not far from Nashik, is an important centre of collection of onions and chillies. The sugar produced in the region has promoted the confectionery, industry at Rawalgaon. Despite the dominance of sugarcane, bajri, jowar, wheat and pulses still remain the principal crops of the area, occupying land which is covered with thin soil. Wheat, no doubt, needs irrigation and grows in only irrigated areas.

The area which was otherwise dry and infertile has been rendered agriculturally very productive by canal irrigation, the benefits of which are visible in the economic landscape of Kopergaon-Shrirampur tract which stands like an island in the parched hinterland of subsistence agriculture. While the canal irrigation has brought prosperity to the region, it has led to a degradation of the quality of soil which tends to be alkaline. Certain parcels of land have been given up because of extreme alkalinity. The farmers and the agriculture department of Maharashtra are well aware of this problem. The harmful effects of the rise of water table become clear once the sub-soil water table reaches within 10 feet from the surface. A further deterioration leads to either water logging or the appearance of salt efflorescence. Draining the sub-soil, by whatever method, is the only effective way out. It is much more difficult to get rid of the alkalinity, if the salts appear on the surface.

This is not an industrially developed region except Nashik which has attracted a few industries. The most important of these is at Ozar, Hindustan Aeronautical plant, assembling aircrafts and a number of engineering industries like tractor, and many small units manufacturing transport equipment, metal products and chemicals and chemical products. Printing is a very special industry of Nashik with the Government Security and Printing Press located here. Some other centres have developed cottage industries. Sinnar about 30 km south-east of Nashik is known for the manufacture of 'bidis', a type of native cigar. In the sugar producing areas, there are distilleries that produce alcohol.

The region has an effective network of roadways with Pune-Daund-Manmad branch of Central Railway traversing north-south, providing a direct link to Delhi. Ahmadnagar-Nashik and Ahmadnagar-Aurangabad are the two principal trunk routes of the area. Nashik, with its urban agglomeration (429,420—1981) is the only important town of the area. With an artillery training centre of Indian Army at Deolali Cantonment, a small town developed around Nashik Road Station, and Trimbak the source of Godavari just about 30 km from there, the town is one of the major urban centres of Maharashtra.

Located on the bank of the river Godavari and close to its source, it is an important place of pilgrimage for the Hindus and is identified with Panchavati, the sacred banyan grove mentioned in the Ramayana, an ancient Hindu epic. The town has, over the decades, acquired many more functions besides its religious base which is symbolized by the sacred bathing ghats on Godavari, temples with chiming bells and chanting of prayers, the throng of devotees on religious occasions and its old buildings and much too narrow streets all converging towards the river. The old core of the city still exudes an air of ritualistic styles and speaks of the antiquity of the town with a Brahmanical culture. The later accretion to the city is more of commercial and administrative functions. The official quarters, a few commercial establishments and hotels lining the Bombay-Agra road have provided a second nucleus and the railway station a third. The peripheral growth has been induced with educational institutions and new residential extensions with stray workshops and small industries. Close to Nashik is Trimbakeshwar, at the foot of the Sahyadri, with a temple of lord Shiva which is as important

a religious place as Nashik. Not far from Nashik is the Ozar Mig Factory which provides the backdrop for a few other engineering industries. The town and the railway station, about 10 km apart, have been joined by a linear growth of settlement along the road, with shops, hotels, banks, transport agencies and the like, occupying the road frontages and residential colonies filling the space on the rear. Deolali, a cantonment town, is considered a hill station and attracts tourists seasonally. Being close to Bombay, the city is connected with Bombay by a local train, Panchavati express, which makes a daily run between Bombay and Nashik. An important educational centre, it is growing rapidly with the introduction of more industries in its neighbourhood. Manmad and Igatpuri are the two important railway stations in the vicinity, the former being a railway junction while the latter is just east of the divide from where the steep incline down the Ghats to Bombay starts. Kopergaon, Shrirampur and Rahuri are other important places in the valley, the last one being the site of an agricultural university. A place which has recently come into prominence and attracts numerous visitors is 'Shirdi', the place of a Muslim Saint called 'Saibaba'. Unlike the traditional and age-old religious places, this attracts tourists of a different genre who believe more in the miraculous powers of the late Saint, and would like to be its beneficiary than the class that derives satisfaction in being the devotee of God and would like to imbibe an infinitesimally small fraction of the divine virtue. Regardless of the Cult, the place is flourishing with its hotels, mostly restaurants, and guides, not to talk of smart alecs who lurk around watching for an opportunity to make quick bucks.

The Ahmadnagar-Balaghat Plateau.—With a general elevation of over 600 m ASL, sloping north-west, south-east, the plateau stands as a major divide between the Godavari and Krishna drainage systems. Immediately south of the plateau is Bhima, a tributary of Krishna, with its left bank tributaries taking their origin from this plateau. The westernmost extremity of the plateau is marked by some higher ranges like Harishchandra and Baleshwar range dissected by Pravara, Mula (both tributaries of Godavari) and their sub-tributaries on the north, and Kukadi and Ghod on the south. The plateau running through the entire breadth of Maharashtra is considerably narrowed in the middle and indented by the headward erosion of the streams, particularly Sina from the south. In the south-east extension river Manjra cuts it right along the centre following a south-easterly course before it is captured by a tributary of Godavari flowing down the northern escarpment of the plateau. One may subdivide the plateau into two parts, the Ahmadnagar plateau in the north-west and the Osmanabad-Latur-Ambejogai plateau in the south-east. The plateau west of Ahmadnagar, with Harishchandra range and its eastern offshoots, resolved into inselbergs, is dry and has been a poor country. Parner region, just west of Ahmadnagar, is perpetually dry, and impoverished.

The western fringe of the plateau, at the foot of the Sahyadri with many pockets of deep sedimentation, inherited from an earlier palaeoclimatic phase and well preserved despite ravines, is the scene of garden cultivation geared to the production of bananas and grapes with the help of well irrigation. Kukadi canal has offered adequate relief to the area and the 'Ottur-Ale' tract has become a scene of intensive cultivation. The command area of Kukadi is likely to cover Junnar, Narayangaon and Parner talukas and extend even further east. The Manjra plateau, east of Ahmadnagar, with an average altitude of 650 m, is dry and grows only kharif crops. The only means of irrigation are a few reservoirs built across Sina river and its tributaries. In the entire area, Jowar pulses and groundnut are the most important crops. Despite a low level of development, this dry tract has a relatively high percentage (more than 80 per cent) of land under cultivation and a concentration of scheduled caste population which traditionally provided the cheap labour. In the absence of irrigation, the yield is low and the region remains poor even agriculturally.

There are no industries on the plateau, though Ahmadnagar has attracted a few, particularly machine manufacturing and structurals. The village settlements strung along the waterline, relatively fewer in number, are medium sized. The area has a good net of motorable and non-motorable roads. Ahmadnagar and Junnar are the two important places on the plateau in the western half, and Osmanabad, Latur and Ambejogai in the eastern half. Junnar, a town commanding the Naneghat pass that leads to Konkan, may have been an important settlement in early historic times, but to-day carries an unmistakable imprint of its medieval origin with its mosques, and a sizable Muslim population. The place has acquired added historic importance because of the hill fort Shivneri atop an adjacent hill, where Shivaji, the Maratha ruler, was born in the 17th century. A taluka headquarter to-day, it was a town of great strategic significance during the medieval period, when it commanded the Kalyan-Junnar-Ahmadnagar road.

Ahmadnagar (181,081-1981) is by far the most important place on the plateau. Founded in 1490 by Ahmed Sah, the town with its fort and partly traceable wall, the identity of distinct professional groups occupying specific areas in the walled town, carries a medieval look. It was from Ahmadnagar that Aurangzeb launched many of his campaigns against Shivaji. With a poverty stricken poor hinterland, the only virtue of the place was its commanding position, half way between Aurangabad and Pune. The tradition of medieval fortifications was continued during the British period and the town became an important Cantonment. Over the decades, it was almost stagnant until recent years when a few industries and the co-operative sugar factories that form the focal point in the politics of the State brought it into prominence. With roads radiating in all directions, it is well connected both by roads and railways.

The southeastern extension of the plateau comprising Beed and Osmanabad area is relatively dry, and well delineated from the Godavari plain in the north and the Bhima valley in the south by a steep escarpment. These escarpments owe their origin to slope retreat, lying as they do in a dry area. The Ramlinga Ghat escarpment, 30 km east of Barsi, running further south to Tuljapur and Naldurg, stands like a formidable barrier when looked from the plain. On the northern end, the Ambejogai escarpment overlooks the Godavari valley. The preservation of these scarps owes itself to aridity and the absence of fluvial erosional processes which could have mellowed them into gently flowing slopes. The plateau, however, is covered with patches of fertile soil and the Manjra river, a wide and shallow waterway hardly comparable with rivers having well demarcated valleys, has been more of an agent of transport, choked with alluvium during rains, than an agent of erosion.

With just about 50 per cent of the cultivated land under irrigation, largely from wells, agriculture has to depend on rains. In thick soils and irrigated areas, rabi crops are grown. The principal crops of the region are jowar and pulses. Besides agriculture, livestock farming is an important occupation in the area. For generations, the plateau has provided the grazing land and cattle breeding has emerged as an important occupation of the area. The reputed "Deoni" breed of Cattle of which an annual show is held at Udgir comes from this area. Cattle markets are also held at other places viz. Deoni, Hunder, Golli, Murud, Ausa, Nilanga and Yegur. With hardly any trace of modern industries, cottage industries like leather tanning depending on the cattle wealth of the region, handloom and wool weaving, are still important. Of late, an industrial estate is set up at Latur with provisions for starting agro-based industries, and the manufacture of agricultural implements. Rearing of sheep by 'Dhangars' and the fabrication of *Kambhis* by a local community called *Sangars* is an important occupation.

The density of population and the settlements, as a whole is low, in as much as the support capacity of the land is limited and the industries have not made any headway. The two principal railway lines, one bifurcating from the South Central railway at Parbhani on to the plateau via Latur road, Udgir and Bidar and the other from Latur traverse the plateau to Barsi, Kurduwadi, Pandharpur and further to Miraj. Important places like Latur and Osmanabad, Naldurg and Udgir, located on the margin of the plateau, are supported by more intensive cultivation in the valleys down below, while catering at the same time to the needs of the population on the plateau.

Ausa, Ahmedpur, Ambejogai, Latur, Osmanabad, Tuljapur and Udgir are some of the important places on the plateau. Latur (111,961—1981) is the largest settlement in the region. Supposedly the original home of Rashtrakutas, one of the early ruling dynasties of Maharashtra, it has retained its regional importance resulting from its high connectivity and the fertile hinterland formed by Manjra plain. It is an important centre of collection and distribution of agricultural produce of which pulses in general and *Udid* in particular are important. A wholesale cotton market, and a few ginning and pressing mills, besides 'dal' mills, make the place commercially viable. Naldurg, a fort town, lying on the edge of the plateau, is noted for its fortifications. In fact, Naldurg, Parenda, Ausa and Osmanabad are all important fort towns occupying strategic positions.

Osmanabad, the district headquarters (38,958—1981), on the western edge of the plateau, is a small sleepy town devoid of any significant economic activity. Administration is the main function. With open drains, narrow lanes and single storeyed masonry houses, the town appears more like a large village in the midst of agricultural landscape. A 'Dargah', the mausoleum of a Muslim saint, is a noticeable landmark and not far from the town are the Dharasiva caves of Jain and Brahmanical origin. The fort at Osmanabad is a historical monument and has been at the centre of conflicts between Bijapur, Ahmadnagar and Gulbarga, the former two being almost at equal distance from Osmanabad.

Bhima Basin.—The funnel shaped triangular basin of Bhima with its apex at Pandharpur, where the river is known as Chandrabhaga, and the base formed by the Sahyadri range, is economically the most prosperous region of western Maharashtra. A bundle of subparallel tributaries and sub-tributaries of Bhima, originating from the Western Ghats and confined between Ahmednagar plateau on the north and Mahadeo range in the south, converge down the Sahyadrian piedmont, one joining the other, till they all merge into Bhima. Kukadi and Ghod from the north, and Indrayani, Pavna, Mula and Mutha from the south, are the important tributaries. Besides these, Sina from the north and Nira from the South are two major tributaries joining Bhima, the former coming from Ahmadnagar plateau and the latter from the Sahyadri, close to Bhor about 50 km south-west of Pune.

The western half of the area is cut into a series of east-west narrow valleys and flat divides formed by the surfaces of erosion whose flatness is attributed not so much to their erosional genesis as to their near horizontal disposition. The valleys and the flat divides are separated, on one side by a steep escarpment ranging from 100 to 150 m in height and on the other by a relatively gentle slope. The plateau divides are dotted with irregular inselbergs appearing as short, breached and truncated ridges. A north-south profile of the landscape will show a repetitive pattern with flat plateau divides overlooking the valleys and separated from the latter by an escarpment of slope retreat, badly indented by transverse tributaries, characterized by a glacis or a pediment at the foot of the escarpment, a gravelly or a silty terrace and a narrow channel with a rocky bed. The cross profile of these valleys is asymmetrical with a steep escarpment, a glacis or a terrace on the one side, all compressed into a few hundred metres, and a relatively gently sloping plain on the other. The stream channels usually with a steep gradient carry a trickle of water during the year, though both stage and discharge show a considerable increase during the monsoons in general and immediately after the prolonged rains in particular.

The plateaus taper further east and the valleys open out into plains which have some of the best cultivated terraces in Maharashtra. Climatically, the eastern part of Bhima basin is semiarid and some parts receive rain as low as 400 mm. Some of the driest parts of Maharashtra like Shrigonda-Daund tract, Karjat-Karmala tract and Malsiras-Akluj tract occur in this region, and some part or the other of the region is always hit by drought and consequent scarcity every year. Despite these adverse climatic conditions, the region exhibits a level of development which is above average. Its strategic location, historical background, and the recent development efforts have imparted to it a personality which is not only most distinct but also significant in the political and economic life of the State.

Broadly, the area can be divided into two sub-regions, the Poona region on the west and 'Indapur-Sholapur' region on the east. Pune region, with the benefits of canal irrigation, growing industrialization, and an efficient network of transport, is one of the most developed regions of the State. The town itself has made no mean contribution in the economic growth of the region. Nira and Mutha canals, developed during the last century, and the addition of Ghod and Kukadi projects during the current decade have enhanced the agricultural productivity of the region. Being close to the Sahyadri, the river terraces form the ground water reservoir and support an intensive culture that specializes in cash crops. Besides sugarcane which is a universal cash crop, vegetable gardens and vineyards are a common sight. Some areas specialize in the production of onions, chillies and bananas. Proximity to urban centres like Bombay and Pune, quick and effective transport and well developed means of irrigation have induced the farmers to switch over to cash crops with shorter maturity cycles. Dairy farming has, of late, picked up and a few milk co-operative societies have developed which, besides promoting dairying, help the farmers in the marketing of milk. West of Pune, there is a dominance of rice in the agricultural landscape, around Pune it is the vegetables and floriculture, and east of Pune, it is jowar which is the most important crop. With a number of sugar mills in the vicinity (Theur, Daund, Indapur and Baramati), the farmers find it more lucrative to switch over to sugarcane and the acreage under jowar has progressively declined. Following the Pune-Solapur road for over 40 km, one is struck with lush green fields growing sugarcane, vegetables and a variety of garden crops with truck loads of sugarcane being taken to sugar factories or vegetables being washed and readied for the wholesale market at Pune.

The industrial landscape of the region centres around Pune and is aligned more specifically to Bombay-Madras railroad. For about 30 km both east and west of Pune, there is a string of industries with occasional clusters. West of Pune, the assemblage of heavy engineering industries with trucks,

trailers, oil engines and pumps, machine tools, dairy equipment, electrical goods, automobiles and scooters along the Pune-Bombay road makes an industrial zone. On Pune-Solapur road, there are not only a few industries but also an industrial estate. The most important industrial estate around Pune is at Bhosari about 15 km north of Pune which houses a variety of industries and has profusely attracted middle level and small entrepreneurs. The over-concentration of industries at Pune has increased the dependence of other areas on it for employment, and caused an unprecedented growth of its population, bringing in its wake a variety of problems. The only other centres which could be mentioned as industrial centres are Walchandnagar, specializing in the manufacture of heavy engineering goods and Bhore producing synthetic leather. The congestion, both industrial and residential, in Bombay, has forced industries to move out of Bombay and the only other suitable place with all the infrastructure is Poona, not far from Bombay with which it is very effectively linked by rail, road and air.

The region with the backdrop of Sahyadrian arc sending out offshoots of forested spurs which are the sites of some of the most important forts, and a number of reservoirs, is one of the most scenic areas of the State. A well laid out system of transport has increased regional mobility, and the cultural impulses propagating from urban centres have brought forth the awareness of innovations in diverse fields even in the remotest parts, and established very effective links with Pune which is the fountain head of all political, economic and cultural activities of the region. The region is dotted with urban centres of all sizes. In addition to the taluka places with their economic and administrative base, there is a sprinkling of central places which cater to the demands of the rural population for specialized functions and services. Depending upon their nodality and assemblage of functions, the small service centres occupy different levels in the hierarchical organization of towns. Khed, Sirur, Daund, Baramati, Bhore are all taluka headquarters and link the countryside with Pune. These also serve as local centres of trade, though some of them have acquired very specialized functions. Baramati as a centre of cotton and gur trade, and Khed as a wholesale market for onions and chillies are well known. Daund, a railway junction of some importance has grown into a large settlement and can be aptly termed a transport town.

Pune (1,685,266—1981), is the focal point of the region and undoubtedly the most important city in western India, next only to Bombay. Recognized as the cultural capital of Maharashtra, the town has grown from its historic antiquity into a modern metropolis, beset with all the problems that a million city faces in a growing economy like India. Originally a small agricultural settlement and not far from Kondana fort (the present Sinhgad), Pune came into prominence during the reign of Shivaji when it became his temporary residence and a relatively permanent residence of his mother, the vestiges of which are still preserved in what is known as 'Lal Mahal' or the red palace. The possession and control of Sinhgad was then much more important, and Pune, for hundreds of years, remained a piedmont settlement with river ford and a site for temporary camps which induced its growth. The rivalry between the warring groups centred around the control of Sinhgad and not Pune. In the vicinity of Pune were also a number of villages like Kothrud, Hadapsar, Koregaon, Wanowari, Khondwa Budruk, Khadki, all with an agricultural base.

The nucleus of the old town was formed by the original Hindu settlement later named 'Kasbapeth', not too far south of the river Mutha, around the temple of 'Puneshwar'. With the advent of Muslims on the scene, the place began to be used as a military base and part of the settlement was secured against surprise attacks by a masonry wall, creating an enclave known 'Juna Kot', the site of the Muslim garrison. But for a temporary period during which Shivaji and his mother made Pune their residence, the town remained neglected and came into prominence with the emergence of Peshwas, the hereditary prime ministers of the descendents of Shivaji.

As is customary in the towns of Deccan, the different quarters in the town were known after weekdays or after some important personage who started a market in a specific area. The old core of the town, a result of continuing accretion to Kasbapeth, expanded during the Peshwa rule in the 18th century and was subsequently divided into eighteen peths, some occupying the areas where markets were held on some weekdays, and the others named after some of the Peshwas. Some of these old 'Peths' were exclusively residential like Sadashiv and Narayan Peth, while others were meant to be occupied by certain functions. Bhavanipeth was meant for wholesale trade and Ghorpade was the cavalry station of the Peshwas. The old town despite its growth remained confined to southern bank of Mutha and it was only after the emergence of the British rule that the town crossed the river and the development on northern bank of the river started.

The British developed cantonments on the two sides of the town, thus virtually blocking the entrance to the city and securing themselves against any possible revolt. Between Pune Cantonment on the east, and the Khadki Cantonment on the northwest, grew the official quarters of civil administration, the Commissioner's office, Collectorate, Central building, an extension of the State secretariat, Council hall, the General Post Office, the Police headquarters and finally the Pune Railway station. Also, the Cantonment market and the attendant shopping complex with a central Street (now called Mahatma Gandhi Road) were encouraged to cater to the needs of the administration. Thus, the town was divided into two parts, the old city and the Cantonment, the former with its closely packed houses, narrow streets, wholesale markets teeming with the population of Marathi speaking people, and the latter with its well laid out streets more spacious avenues, better spaced buildings, largely inhabited by office functionaries and the administrators. The old town and the Cantonment presented a cultural dichotomy which persists even to this day.

The affairs of the old town came to be better managed with the establishment of Pune Municipality in 1858. A new shopping area known as Laxmi Road emerged and the residential extension north of the river, called Shivajinagar, grew rapidly. Today the town on the left bank of the river Mutha is almost as important as the one on the right bank.

During the last quarter of a century or so, the town has witnessed a very phenomenal growth, both morphologically and demographically. Not only the left bank of the river Mutha is developed, but much of the space available between Bombay-Pune railway line and the river is packed with buildings of all functional types. During the last two decades, there has been an unprecedented growth of industries around Pune, with more public institutions and Government establishments added to the existing fabric of the town.

The old core of the town with its markets, wholesale trading, and the old middle class residential, is still teeming with life, though cracking under the weight of congestion and over-population. The traditional craftsmen and the old traders suffer from inertia and continue to occupy their ancestral houses. The old family houses, the *Wadas*, though dilapidated, are still occupied. On one side of the old town is Sadashivpeth, the reputed Brahmin quarters, known for the conservatism of its inhabitants who are also the custodian of traditional brahmanical culture of the Peshwa period. Laxmi road is the main shopping thoroughfare of the town. Later residential extensions either on the left bank of Mutha or elsewhere are better planned, though the last 25 years have witnessed a complete degradation of the town with the development of sub-standard housing colonies on the peripheries and the spawning slums which are ever on the increase. The squatters colonies, locally known *Jhopadpattis* have grown at such a pace that they figure more prominently in the urban landscape than the better planned extensions. The growth of industries attracting enormous manpower and the development of slums have been the concurrent processes. All the regional and city plans remain on paper while enough disorder is created by people devoid of means but desperately looking for accommodation, and finally settling in 'Jhopadpattis'.

Pune, once the quiet town of the retired people, and centre of education, has turned into an industrial giant with all the attendant evils of over-population, congestion, strained civic amenities and increased crime rates, with an ugly face presenting formidable problems, much beyond redemption in the near future.

The Saswad Plateau.—Just south of Pune basin, rising over Diwaghat escarpment, is the Saswad plateau attaining a height of about 800 m and drained by the river Karha, a tributary of the river Nira. The plateau represents one of the drier tracts of Maharashtra with cultivation confined to the valleys where jowar is the principal crop. In the drier eastern part, sheep grazing is the principal occupation. Historically, the region is well known for many events centred around the fort of Purandargad which was the object of exchange between Shivaji and the rival powers, several times. Further east, Jejuri is an important religious place with the temple of Lord Khandoba (Shiva) on a hill commanding the view of the valley. The area is the traditional home of 'Dhangars', the shepherds who practise transhumance between the rainy Sahyadri and the dry Deccan plateau to the east. During the dry season, flocks of sheep are shepherded to the hills in search of a cooler environment, and with the onset of monsoons the shepherds return to the plateau. Saswad, the headquarters of Purandar taluka, is an ancient village on the river Karha, a shallow non perennial trickle of water. Despite a dry climate, the area around Saswad is known for the cultivation of fruits like figs, oranges, custard apples and chillies. Recently, some reservoirs have been built for irrigation, but the region still hangs on precariously to a very uncertain state of agriculture depending largely on the monsoons.

Mahadev-Khanapur-Jath Plateau.—Like Ahmadnagar-Balaghat plateau that forms a major divide between Godavari and Bhima rivers, Mahadev-Khanapur plateau stands as a divide between Bhima and Krishna valleys. Aligned northwest-southeast, the plateau slopes gently eastward. With an average height of over 700 m, it provides the base for a much higher Mahadeo range which attains of over 1400 m where it branches off from the Sahyadri. The plateau carries thin soils that permit only Kharif crops. A few tanks that have been developed, promote agricultural productivity only locally Yerla and Man drain the area, the former to the river Krishna in the south, and the latter to Bhima in the north. On both these rivers, reservoirs have been built which irrigate the areas downstream. The plateau is cut across by Satara-Pandharpur route and a longitudinal road running from Satara road to Bijapur. The area being semi-arid, is known for cattle and sheep grazing and presents a desolate picture in summer. Aundh, Vita and Jath, the first and the last being the former seats of small principalities of the same name, are now neglected settlements and appear in utter disrepair.

The Krishna Valley.—The Krishna valley is the southernmost region of Maharashtra plateau occupying its western periphery. The valley is like a shallow basin confined between the Sahyadrian spurs on the west and the Mahadeo plateau on the east. The river Krishna itself debouching from the Mahabaleshwar plateau flows in a 2 km wide box like valley for about 25 km from its source, till it opens out at Wai and makes wide plains. Flowing almost parallel or sub-parallel to Sahyadris, it collects a large number of tributaries descending from the Sahyadris, and joining it at regular intervals of 15 to 20 km. Venna, Koyna, Warna and Panchganga, Dudhganga and Vedganga are the major tributaries joining Krishna from the right bank, each in turn making a narrow but silt covered fertile plain. Not only the heavy rainfall of the Sahyadris but even the weathered mantle, the brown silt, is brought down by these rivers and deposited in their flood plains. East of Krishna, there are no major tributaries except Yerla. The river leaves Maharashtra about 15 km south of Sangli.

The entire Krishna valley and particularly the riverine plains of its tributaries are the scene of deep sedimentation producing linear fertile plains. The hill spurs are relatively bare and grass covered. Krishna river was the earliest in the State to be harnessd for irrigation. A weir at Karad in the last quarter of the last century developed a storage that feeds even to-day the left bank plains of the river, down Karad. During the last twenty-five years, the water resources of Krishna river system are being developed in a planned way. Dhom dam on Krishna, 10 km upstream from Wai, Kanher dam on Venna, 15 km upstream of Satara, a dam on the river Warna and another on Bhogawati, south of Kolhapur, are the major irrigation works. Added to these are the benefits of lift irrigation practised on a large scale in Panchganga basin.

All along, from its source downward, the valley carries rich alluvial soil, the depth and extent of which increases as one moves downstream. With adequate water, either from the surface or ground sources, thick and fertile soil and an enterprising peasantry, the Krishna valley has become agriculturally the most prosperous region of the State. Double cropping is common in the irrigated tracts and has produced a landuse that ensures the maximum return from agriculture. Besides Jowar, the main cereal of the region, sugarcane is the principal cash crop followed by tobacco, chillies, turmeric and other garden crops. The Panchganga basin, with its focus at Kolhapur, is endowed with exceptionally rich soil, the accumulation of the annual silt, and is known for the cultivation of sugarcane which occupies about 2 to 5 per cent of the net cultivated area. About a third of the cultivated area is under non-food crops. During the last hundred years, there has been a remarkable increase in the acreage of groundnut, sugarcane, tobacco and chillies and a corresponding decrease in the area under jowar, cotton and some of the non-edible oil seeds. The entire agrarian economy is oriented to cash crops and commercialization. Much of the benefit of irrigation goes to cash crops of which sugarcane alone claims 75 per cent in terms of acreage.

The practice of irrigation in the southern part of the valley, including Kolhapur and Sangli districts, rests on wells, lifts and tanks, and there is virtually no irrigation from canals. The present lift irrigation which consists of a 'jack well' pumping water directly from the river has evolved from the original *bhudki mots*—a shallow hole in the bed of the river from which water was lifted in a mot by a pair of bullocks. To make lift irrigation more reliable, weirs have been built across streams to ensure a permanent depth of water at lift sites. The most characteristic example of lift irrigation is Panchganga river lift irrigation scheme with 5 weirs across the river, between Kolhapur and Shirol, and 40 pumps installed at well spaced intervals.

Though not as important as Bombay and Pune, the valley has its own share of industries, both large and small-scale. Cotton textile, no doubt, was a major industry in the early decades of the century. Today, the textile mills located at Kolhapur, Miraj, Sangli and Madhavnagar, depending on cotton brought from other areas, and though not very efficient in their running and management, provide employment to a large number. Kirloskarwadi, specializing in engineering goods producing agricultural implements and Ogalewadi with its glass works, are important industrial towns. During the last 25 years the region has acquired about a score of sugar factories, run on co-operative basis, and a large number of engineering workshops. The former is attributed to the expansion of sugarcane cultivation in the area and the latter to the mechanization of agriculture and irrigation and the pivotal position of road transport in the area. The national highway No. four which passes through Kolhapur has generated enough demand for engineering workshops that could repair automobiles and tractors. The increasing use of pumps and agricultural implements has further pushed up the growth of engineering industry. Other agro-based industries are oil mills crushing groundnuts and the processing of tobacco and bidi making at many places. Kolhapur is particularly reputed for iron casting works, and the foundaries here are commissioned for precision moulding by large industrial firms in Bombay and Pune. Jaisingpur and Ichalkaranji are traditional centres of handloom and powerloom industry and it is the craftsmen who keep it going and prosperous without any significant local advantage. Silver ornaments of 'Hupari' a small settlement in Kolhapur, are in demand all over the country.

The productivity of the land being high, settlements are closely spaced, the larger ones having stuck to the fertile alluvial crescents enclosed by the meanders of Krishna and its tributaries. The average size of a village is a little over a thousand, though there are extremes on either side. The area is covered by a good network of transport, essentially the roads, which run parallel or sub-parallel to Krishna river, with intercepts running east-west. The most important of these routes are the South Central railway running through Satara road, Karad and Sangli, going further down to Bangalore, and the national highway number four, the busiest national highway from Bombay to Bangalore via Pune, Satara and Kolhapur. Thus the region has good accessibility and a fairly high degree of connectivity. Satara, Karad, Kolhapur, Sangli, Miraj and Ichalkaranji are the major urban centres. The density of towns and the dominance of urban and industrial landscape is visibly more important in the southern part of the region. Satara (83,604) forming the apex is a slow growing town. Devoid of any significant industrial base, it has remained a district headquarters, without enlarging its economic base. The district as a whole is not very productive, much of the land outside Krishna valley being occupied by rocky plateaus and a mountainous terrain. South of Karad, the region, with the widening of the valley and increased intensity of cultivation, attains greater prosperity. Karad (54,372—1981) located on the confluence of Krishna and Koyna is an ancient settlement, but like Satara has failed to attract much economic activity and growth. It has neither the industrial potential being 6 km. away from the railway station of the same name, nor a very strong cultural component in its location. Being a taluka headquarters, it grew moderately and remained an important centre of collection and distribution. In the south, Kolhapur, Sangli, Miraj, Jaisingpur and Ichalkaranji form a cluster not warranted by the economy of the region. Their locations with the exception of Kolhapur, and more so their growth is attributed to their being the capitals of the former princely states. Thus, Kolhapur, Sangli, Miraj, Kurundwad, Aundh and Jath, each of these states had a capital. Kolhapur, a Maratha state ruled by the Chhatrapatis (Kings) tracing their lineage to Shivaji and his younger son Rajaram, and Sangli and Miraj the two states promoted during the Peshwa rule, co-existed as good neighbours during the British rule, and both developed their capitals. While the capitals of the lesser principalities declined, Sangli and Miraj gained in status because of their former pre-eminence and the rich economic hinterland.

The region is unique in the organization of its settlements. No where in Maharashtra there is such a cluster of closely spaced large villages which, for want of a more suitable term, may be called agricultural towns. This speaks for the support capacity of the land and stands in sharp contrast to the industrial villages or townships in the vicinity of Pune. The small and medium size settlements are equally significant in the lattice, but well spaced service centres are what make the settlement pattern almost close to ideal.

Kolhapur (351,073—1981), the capital of the former princely State of the same name, and presently a district headquarters, occupies the centre of Panchganga basin. The origin of the town dates back to the beginning of the Christian era. The early town developed on the sites of six settlements (Brahmapuri Uttareshwar, Kholkhandoba, Rankala, Padmala and Ravneshwar) which were subsequently merged, and the city later grew around the nucleus of Mahalaxmi temple. Besides being

the capital of the State, the place also assumed importance as the seat of the British resident who controlled, besides Kolhapur, a number of adjacent States. The wall round the city was built in the late 18th century as a precaution against the attacks from the neighbouring States particularly Sangli.

The linking of the town by a railway in 1891 was a tremendous boost to its growth, and a number of new extensions like Shahupuri, Laxmipuri and Rajarampuri appeared within a short time. A number of depressions in the vicinity of the town were filled up and the town appeared more respectable in the beginning of the 20th century. Occupying an area of over 25 sq. miles, the town boasts of a number of monuments and palaces. During the last quarter of a century, a university has been added to the functions of the town. It is a major wholesale centre of 'Gur', besides being the traditional centre for the manufacture of leather goods.

A limited volume of functions notwithstanding, Kolhapur has a history which maintains a continuity and link with Shivaji the founder of the Maratha empire, and is a seat of Maratha culture. With its typical cuisine, the dress style, the social customs, sports tradition of wrestling, and a fondness for music, the place still retains the aura of its past and is undoubtedly the principal regional centre of south Maharashtra. One of the rulers of Kolhapur, Shahuji Maharaj, was very progressive and thought much ahead of his time. His reforms included uplift of scheduled castes and women and universal education. Not far from Kolhapur is 'Panhala', a hill fort of historic antiquity, now transformed into a hill resort. Surrounded by greenery of sugarcane in the north and the forested hills on the west, it presents a very salubrious climate. The present day development of the town includes a string of industries on the outskirts, particularly along Kolhapur-Bombay road. Sangli and Miraj are twin towns located hardly 10 km. apart. The former is a district headquarters and the latter a taluka place. Sangli, located in the midst of a fertile hinterland is an important sugar producing centre, with 8 sugar factories in the district, and specializes in the trade of jaggery, tobacco, cotton and chillies. Miraj, being a railway junction and a break of bulk settlement only survives without much growth. Narsobawadi is a religious place in the vicinity of Sangli.

The entire Krishna valley is identified with the theatre of Maratha history, the wars they fought, the royal intrigues and the family feuds they indulged in, the following they mustered and above all the culture they propagated. The Maratha chieftains who with their loyalty to the heirs of Shivaji, assembled under the banner of the Chhatrapati of Satara or Kolhapur, were eternally proud of their valour, their steadfastness and their attitude of sacrifice. Here developed the tradition of *Powadas*, a kind of ballads in the praise of Shivaji. A large number of forts on the west atop the spurs of the Sahyadri overlooking the valleys, and the lesser *gadhis* further east, with occasional large mansions of some important Maratha chieftains thrown in, speak for the nobility that once dominated the region.

Though Krishna is the lifeline of the region, the tributaries joining from the west are not less important. The amount of sediments brought by the tributaries besides being enormous, is of fine texture. The silt brought by Warna, Koyna and Panchganga rivers is very fertile and supports intensive cultivation.

Lower Bhima valley.—Down the Bhima-Nira confluence, extending right upto the former's confluence with Krishna, on Karnatak-Andhra Pradesh border, the region is named lower Bhima valley. With wide riverine plains, insignificant relief, the alluvium filled valley of Bhima, compressed between Osmanabad-Latur plateau on the north and Mahadev plateau on the south, this area promises to be agriculturally one of the most productive in the State. The advantages of the vast stretch of this fertile plain have, unfortunately, been offset by a climate of which the most important features are scant rainfall and frequent droughts. The situation has been partly remedied by Nira Canal which irrigates the land on the right bank as far down as Pandharpur. The construction of Ujjani dam on Bhima near Indapur, with an irrigation potential of 1,89,000 hectares of land, has made the region a land of promise. Till recently, Pandharpur-Kurduvadi-Sholapur-Akkalkot region was a land of jowar and cotton, the former being the staple food of the people and latter a traditional cash crop. The agricultural landscape is even today dominated by rabi jowar, supported as it is by rich fertile black soil which besides being moisture retentive gets the benefit of some rain from the north-east monsoons. The late rains from the retreating monsoons are popularly known as Diwali rains. The winter is a period of low evaporation and the jowar, the main crop grows to maturity by the end of February. The land and climate are equally favourable to cotton, though its acreage is subject to more frequent fluctuations, governed as it is by market mechanism, than the acreage under jowar, the demand for which never

decreases. Away from the fertile valleys of Bhima and Sina, the cultivation of pulses assumes significance, since these can withstand moisture stress for a longer period than either jowar or cotton. Among the pulses, *tur* and *gram* are more important. The cultivation of groundnut is only marginal. The most fertile part of the region is formed by the river terraces which border the Bhima river in its lower stretches. The river Sina, which remains perpetually dry, except for two monsoon months, carries a thin veneer of coarse alluvium in its valley and grows pulses, which are more resistant.

Some of the early industries, particularly the cotton textiles, in the area, developed at Solapur which is the focal point of the region. The cotton textile industry at Solapur was the direct result of local availability of cotton, good transport and cheap labour, besides its location in the midst of a vast market. The region had a traditional handloom industry with weavers spread over at Solapur, Barsi and Akkalkot. It is also known for its *dal* mills. In response to the agricultural economy of the region and the need for central services a number of centres of collection and wholesale market have sprang up, which also carry other services.

With Bombay-Madras railway line and Bombay-Secunderabad road bisecting the area into roughly two halves, transport has been the least of the bottlenecks. The Latur-Barsi-Miraj narrow-gauge railway line traversing it diagonally has improved the overall accessibility of the region. Solapur, Barsi, Pandharpur, Sangola, Mangalwedha and Akkalkot are well linked by roads. In its nodality, Solapur is comparable to any other inland town in the country.

Being on the border of Karnatak, the region occupies a transitional zone sharing the attributes of two sub-cultures associated with two linguistic groups, the Marathi and Kannada. The influence and the dominance of Kannada speaking people is very obvious in Solapur, particularly in the business circles. In Akkalkot, a town about 10 km. from Karnatak border, Kannada appears all pervasive. The area has bilinguism with most Kannadigas speaking Marathi fluently, and almost all Maharashtrians having acquired a nodding acquaintance of Kannada, enough to understand and communicate. The temple of Siddheshwar at Sholapur, an important religious landmark, has made Solapur a place of respect for the Lingayats, the Shaivites of Karnatak. There being no town comparable to Solapur on the other side of the border in Karnatak, there is an incessant seasonal and permanent migration of people from Karnatak to Solapur. The handloom weavers and a large number of industrial workers are reportedly the Kannada speaking immigrants from Karnatak.

Pandharpur, Solapur, Barsi, Kurduvadi, Sangola and Mangalwedha are important urban centres. Solapur (5,13,956—1981) is by far the most important place and the regional centre. A district headquarters and an industrial city, it was once the second most important industrial city of Maharashtra with its cotton textile mills and handloom industry. But it has suffered an industrial stagnation with more industries growing in Western Maharashtra. The town, originally walled passed hands several times between the Adilshahi dynasty of Bijapur and the Nizamshahi of Ahmadnagar and was the scene of a last ditch battle between the British troops and the Peshwas in 1818, when the town finally passed into the hands of the British.

With 5 textile mills, over 80,000 handlooms and 3,500 powerlooms, the city could truly boast of being the textile town. The conditions have since changed, the textile mills face frequent closures, but the handloom and powerloom units have demonstrated unabated expansion. The handloom sector has adopted co-operative management in a big way, and there were 287 weavers co-operatives in Solapur district in 1975. The town, however, has not grown at a pace comparable to other towns in the same size group. With a growth rate of over 18 per cent during the 1961-71 decade, it compares badly with Pune (41%) and Kolhapur(38.2%). Because of a stagnant economic base and inadequate resources, the municipality has not been able to implement any of its town planning programmes effectively. The core of the town throbs with business activities as usual, but ever increasing shanty towns appear on the periphery.

Pandharpur (64,338—1981), a town situated on the right bank of the river Bhima, locally called Chandrabhaga, because of its crescent shaped meander, is a place of pilgrimage of Hindus besides being a regional market. The town has developed around the temple of Vithoba, Lord Vishnu, built in the 17th century. On several occasions, the most important being in the month of 'Ashad', religious congregations are held when religious processions called 'dindis' from different parts of Maharashtra converge. Of these, the most important is the 'Dindi' carrying Dnyaneshwar palakhi, a fifteen-day

march from Alandi near Pune to Pandharpur. On these occasions, the devotees of Vithoba participate in recitation of devotional songs and religious discourses. On the day of the congregation, lacs of people assemble and file past the statue of Lord Vithoba. The worshippers of Vithoba belong to a cult known as *Varkari Sampradaya*. The impact of *Vithoba*, the *Pandharinath*, is so pervasive in Maharashtra, that this has widely entered in folk literature, mythology and family worship, and is comparable to any other devotional cult in the country. The place exudes an air of divinity, an all pervading spell of Vithoba, of a sanctity of spirit, of devotion, and represents an embodiment of all virtues that every believer likes to imbibe. To many simple village folks, Vithoba represents a ray of hope in the midst of misery, turmoil and struggle for daily existence. Besides the temple of Vithoba, the place is studded with temples of other deities.

Akluj, the driest place in Maharashtra, is today known as a town producing sugar and carrying out retail trade and regulating cotton and groundnut sale. Barshi, located on Latur-Miraj light gauge, is known for its 'Dal' and Oil mills. Natepute another large settlement specializes in weaving of blankets from rough wool.

Middle Godavari Valley.—Down Paithan, a very ancient place on Godavari, till the confluence with Manjra, the region is called here Middle Godavari Valley. The region includes the districts of Nanded and Parbhani, besides parts of Aurangabad and Beed. It is paradoxical yet true that the valley has remained undeveloped despite its immense water resource provided by Godavari, its near central location and rich lands. Part of the neglect could be attributed to the princely rule under the Nizam of Hyderabad, but the region remained a backyard of both, the British province of Bombay and the Nizam's territory, of which Hyderabad was the core. A Marathi speaking region, culturally and linguistically aligned to Maharashtra but administratively governed from an exogenous princely seat at Hyderabad, Marathwada remained a land of 'Banjaras' and scheduled caste people, neglected by all. Though relatively dry, it receives more rainfall than some of the pockets in the rainshadow area of Sahyadri, and benefits from the northeast monsoons. Nanded on one end of the region receives, on an average, 900 mm of rains, and the adjacent districts of Beed and Parbhani receive 668 and 902 mm of rains respectively. May is the hottest month when the temperature shoots above 40°C and the minima seldom go below 26°. In contrast, December is quite pleasant with mean maximum keeping below 30° and the mercury dipping to 12° C in the night.

Drained by Godavari and its tributaries, Purna, Dudhna and Sindphana, the region is a shallow basin bordered by Hingoli hills and Jalna-Aurangabad plateau on the north and the Balghat plateau on the south. The meandering Purna river, occupying a divide and a small catchment as compared to its length and channel, is anomalous. The meandering of this river suggests the existence of a planation surface in which it remained entrenched, but much of its basin is captured and the drainage diverted to Dudhna river. The underfit meandering river still flows, but it will not be long, in geological terms, before the entire basin of Purna will be absorbed by Dudhna and subsequently by Godavari.

The middle Godavari Valleys is a land of *Jowar* with pulses, dominated by *Tur* as the second important food crop. *Wheat* is grown in favourable areas. Among the non-food crops, *cotton* is important and Parbhani and Nanded stand out as important cotton producing districts of the State. The thick black soil, particularly in the flood plain of Godavari is suited to *Jowar* which needs minimal moisture in winter for its growth, and gives better return than wheat which needs several irrigations to show a high yield. The valley, all along followed by Manmad-Secunderabad railway, has not shown any spectacular development. The only major source of irrigation being the Yeldari and Siddheswar projects, both on Purna, about 70 km north of Nanded, irrigation is practised on a limited scale, and the high yielding varieties of crops, or the cash crops like sugarcane, have not been introduced on a large scale. The Jayakwadi project, with a dam on Godavari, near Paithan, has yet to realize its vigour since only the first phase the project is over, and the benefits of irrigation have not yet started showing.

The Jayakwadi project on Godavari is one of the largest in the State, with an ultimate irrigation potential of 1,41,000 hectares. The command area of Jayakwadi is the region with maximum economic potential, with its core location, future intensive cultivation and an efficient transport system that may emerge with the improvement of the Godavari Valley railway. Was it not the focal region of Maharashtra during the Shalivahan period of history, when Paithan as the capital city, steeped in the tradition of learning, carried the stamp of authority? It is ironical that the river Godavari, by far the most

important in peninsular India in terms of its navigability, its water resources and its fertile plains, has been treated, in the absence of adequate human effort and the application of technology, as of no consequence. The result has been frequent droughts and famines. These famines, the most severe being the one called Durga Devi famine of 1396, coupled with the military campaigns of rival powers—the Sultans and subsequently the Moghul emperors of Delhi, the Bahmani Kings and the Marathas—led to the desertion of the villages and virtual depopulation, several times during the medieval period, thus dismantling the fabric of the society and its socio-economic organization in a regional frame.

The area suffers from an industrial vacuum, and a few industries that did develop are raw-material oriented. The most important of them is the ginning and pressing of cotton. The textile mill at Nanded, established in the twenties of the present century, is the major industrial unit of the region. Using locally produced cotton and employing the available manpower, the mill is relatively trouble-free. Supporting this textile unit is the Marathwada co-operative spinning mill and a substantial number of ginning and pressing units located all over the region in the midst of cotton growing area. There are more than three dozen ginning and pressing units only in Nanded district. Oil crushing, utilizing the locally produced groundnut, is the second important industry followed by *dal* mills fed with the regionally produced pulses. The support for the industries of the region is derived from a long established tradition of artisans and craftsmen.

With Godavari Valley railway joining at Hyderabad the main Central railway line, the region enjoys a transport facility which, in the absence of necessary entrepreneurship, has not made any significant contribution. An apparent good network of transport suffers from poor condition of roads many of which are only fair weather roads in the absence of bridges and culverts. It must be admitted that the existing road network presents a good layout which can provide the base for an elaborate network of transport in the future. The suitability of this network is evident from the fact that these roads usually run north-south, and appear like intercepts to the main Godavari Valley railway. Thus, Nanded, Parbhani, Hingoli, Pathri and finally Jalna, in the north-west extremity of the region, are well connected by roads. Nanded (1,90,819—1981), the largest city of the area, is a district headquarters. Located on the left bank of Godavari, the place is an important centre of industry, trade and education in Marathwada next only to Aurangabad. The town became a religious centre of Sikhs after the death here of Guru Govind Singh, the tenth Guru of Sikhs, in 1708. The town has quite a few temples, the most known being the Baralinga temple, Balaji temple and Ram temple. The historicity of the town is lost in its economic slide-down, but it may regain its lost glory after the region attains prosperity.

Ajanta-Aurangabad-Jalna-Jafarabad plateau.—Overlooking the Tapi trough from the south, is the Ajanta range backed by the Ajanta-Aurangabad-Jalna plateau, gently inclined to the south-east and drained by the river Purna and its tributary Dudhna, the former being a tributary of the river Godavari. The region forms the southern limit of Tapi trough that is bordered by the Ajanta scarp rising abruptly about 250 m in a distance of less than 8 km. The northern scarp face of this plateau is indented by a number of parallel transverse tributaries of Tapi and Purna. Girna, Tittur, Hivra, Vaghur and its tributaries, to quote a few, are the rivers that descend down the escarpment and join the Tapi or Purna river. The plateau gives the impression of having been uplifted and tilted to the south. From the edge of the plateau, the rivers flow south-eastward, and are fast losing their headwaters to the north flowing streams gushing down the escarpment. The indentations in the scarp have produced steep sided valleys, one of which, the valley of the river Vaghur, has provided a splendid site for the world famous Ajanta caves. The indentation and the recession of the scarp has been so severe that the headwaters of some of the south flowing streams have been diverted northward. There is no doubt that the river Girna once formed headward extension of the river Purna, but has since been diverted to Tapi.

The drainage on the plateau is highly dendritic, and instead of spreading alluvium sweeps the very thin veneer of weathered mantle that develops as a result of moderate weathering on the plateau. Thus, it is infertile and though more than 2/3 of the area is cultivated, the yields are poor. Jowar and bajra are the principal crops, and cotton is adopted as the cash crop of the region. The plateau has not so far developed any major irrigation works and has not witnessed any agricultural prosperity, though there are small reservoirs built across the tributaries of Purna. The northern part of the plateau divided equally between Aurangabad and Buldhana districts is a relatively poor region with the eastern part drained by Purna having specialized in the production of cotton. The southern part of the plateau with Ellora hills on the west and Hingoli hills on the east standing as inselbergs and dominated by two nodal points, Aurangabad and Jalna, is a dry area with more rugged terrain and relatively low density of population. Lying on the margin of the Godavari valley and occupying the Purna-Dudhna doab, the area suffers from gullying and dissection. A very special feature of the area is the occurrence of a crater lake at Lonar about 50 km. north-east of Jalna.

The cultural landscape is dominated by Islamic monuments and medieval towns, their names suggesting an Islamic origin. Aurangabad, Daulatabad, Jafarabad and Khuldabad suggest their association with the Muslim kings. Lying south of Tapi, the region represented the northern limit of peninsular India and the campaigns of Delhi Sultanate started with the annexation of Deogiri, now Daulatabad from the Yadava kings. The region was overrun time and again by warring forces and was perpetually the victim of military campaigns and hostilities, particularly in the middle and late 17th century, when Aurangabad became the headquarters of Aurangzeb, from where he directed his campaigns. Mosques, burial grounds, isolated graves, and above all a sizable Muslim population speak of the inalienable influence and the dominance that Islam had on the region.

With a poor resource base, both agricultural and industrial, the region has remained stagnant for long, and has not yet reached a threshold for rapid development. Since most of the rivers originate in a low rainfall zone and have small catchments, they cannot be harnessed for largescale irrigation. A number of smallscale irrigation works, like tanks and *bandharas*, have lately made their appearance in the agricultural landscape of the area. The area largely depends on subsistence farming dominated by Kharif crop. Cotton is the principal cash crop, and sugarcane has emerged on the scene with the introduction of medium and small scale irrigation. The eastern part of the region, falling in Buldana district, is better geared to the production of cotton with about 30 per cent of the cultivated area under this crop, in contrast to hardly 10 per cent in Aurangabad, and is undoubtedly an extension of Nanded-Parbhani cotton belt. Pulses occupy an important place in the agricultural economy of the area after jowar and cotton, and are grown in relatively poorer soils.

Whatever the industries, they are centred at Aurangabad and Jalna. The main industry of the region is ginning and pressing of cotton of which Aurangabad district alone has more than 30 units, located at Aurangabad, Jalna, Kannad and Latur. Like the ginning units which use local cotton, the oil mills also depend for their raw material on the production and supply of groundnut from the region. Right from the 18th century, Aurangabad is inhabited by weavers and their enterprise supports a number of art-silk-mills. Besides, the Handloom Weavers co-operatives controlling a large number of weavers, generate employment for the traditional artisans.

The region largely inhabited by the Hindus has a good sprinkling of Muslim population, and there is scarcely a village in the district (Aurangabad) which is without a tomb consecrated to its patron saint, known by a general name 'Aulia', 'Saiad', 'Wali', or 'Sadat'. The region is a stronghold of the scheduled castes, many of whom have embraced Buddhism. Marathwada and particularly the Aurangabad region, having been the field of activity of the late Babasaheb Ambedkar, a social reformer and a leader of the downtrodden, who have, of late, turned militant, suffers from a simmering conflict. The scheduled castes enjoying many statutory privileges demand greater share in running the Government, and a change in the name of Marathwada University, after their leader, Babasaheb Ambedkar. A greater concentration of scheduled caste population in Marathwada, and the resistance offered by the militant section of this group, have resulted in occasional confrontations and some of the worst human sufferings that the region has ever witnessed. Perpetual poverty, dearth of employment and age-old discrimination of one group against the other have created a very unstable situation which generates caste based political alignments that exploit the sentiments of the people without helping matters. A massive investment in economic development may prove a better solution to the most socio-political problems, than the piecemeal concessions that are usually doled out.

The region has a prominent place on the tourist map of Maharashtra with the world renowned Ajanta Caves and Ellora rock temples, the former 100 km to the north of Aurangabad and the latter in its vicinity. The Ajanta Caves lie in the valley of the river Vaghur cutting through the northern scarp face of Ajanta plateau, overlooking the Tapi trough. The Caves are carved in the steep sided valley-wall close to the source of the river. The carving, decoration and perhaps even modification of the Caves continued for about a thousand years. The earliest Caves date back to 2nd century B.C., and some of them are of as late an origin as 7th century A.D. According to Fergusson, all the caves are Buddhist in their religious contents as is clear from the sculptures and paintings of Buddha all over, though some of the later caves are embellished with Vedic gods and carry Brahmin and Jain devotees. In all, there are 29 caves of which five (Caves Nos. IX, X, XIX, XXVI, XXVII) are temple caves, the 'Chaityas', while the remaining are the 'Viharas', or the monasteries.

Besides Ajanta Caves, in the vicinity of Aurangabad, are Aurangabad Caves, fewer in number and not so renowned. The Ellora Caves just about 25 km northwest of Aurangabad are another monument to man's ingenuity. Here, unlike Ajanta, the Caves belong to Buddhist, Jain and Hindu religions. Of particular interest are the Hindu and Jain rock temples, the most famous being the Kailash temple with its beautiful sculpture and ornamental details.

Besides the Caves, which are the major attraction and which draw tourists from all over the world, Daulatabad fort and a few monuments in Aurangabad are also frequented by visitors. To promote tourism centred around Ajanta and Ellora Caves, an airport is established at Aurangabad and the place is linked with Bombay, Delhi and Jaipur by air, in addition to the provision of hotel and transport facilities. The result is that the region figures more prominently on the tourist map of India than in the socio-economic landscape of the country. The traditional routes of the 18th and 19th centuries have been improved and the area enjoys a fairly good network of transport, since physical barriers are not so formidable and roads can freely criss-cross the land. Aurangabad and Jalna are the two important towns in the region. Aurangabad (315.997—1981) founded by Malik Ambar, a prime minister to the Kingdom of Ahmadnagar, in 1610, on the site of a village called Khirki, was named subsequently as Falehnagar by his son, and later changed to Aurangabad by Aurangzeb, the Moghul emperor. The town is known for its silk industry and 'Kinkhab', a brocaded variety of silk. The city abounds in mosques and tombs which include the famous mausoleum, built to commemorate the memory of the wife of Aurangzeb, called 'Chand Bibi ka Makabara'. Close to Aurangabad, another town Khuldabad not only has the tombs of many Mohammedan saints but also the grave of Aurangzeb, and many other Muslim kings and princes. Jalna another town to the east, originally Janakpur, has a large community of Muslims engaged in weaving.

The Tapi Trough

Intervening between Satpura ranges on the north and the Ajanta scarp on the south is the asymmetrical Tapi trough, aligned east-west and hardly 60 km in width. The river Tapi emerging from Betul plateau and flowing in south-west direction occupying the northern piedmont of Gawilgarh hills enters the valley down Burhanpur where it is joined by Purna, and takes a westward swing flowing almost parallel to Satpura till it enters Gujarat plain. The entire valley has a much lower average height than the plateau of Maharashtra. From Amravati (370 m. ASL) which forms the eastern extremity of Tapi-Purna basin, the valley descends more than 100 m in a distance of 250 km, till at Jalgaon the height is just about 200 m ASL. Thus, in geomorphic characteristics and climatic conditions, it presents a contrast to Maharashtra plateau south of Ajanta plateau. Its transverse profile, conspicuous by its asymmetry, has a gentle slope on the south and a steep drop from Satpura to the Tapi in the north. The transverse tributaries of Tapi are perpendicular to it and almost parallel to each other. The general constructional slope and the longitudinal profile have not exercised enough influence to induce sub-parallel tributaries. Obviously, the steepness of the valley side slope was so dominant that it did not permit the general slope of the terrain and the longitudinal profile of Tapi to make any impact on the alignment of tributaries. This supports the fault origin of the valley, a quicker development of trough and sudden rush of tributaries and not a case of headward extension and collection of tributaries. The steep slopes on the northern flank of the river have resulted in gullying and creation of badlands which have become more intense on the non-resistant alluvial filling of the trough. Thus, north of Tapi, from Faizpur in the east to Shahada in the west, the entire terrain is intensely dissected and is a serious handicap to agriculture. South of Tapi, the drainage represented by its tributaries is anomalous. Many of the tributaries particularly in the western part, like Buray, Panjhra, Bori, Girna and Tittur, flowing eastward from the Western Ghats, suddenly turn north and join Tapi following an arcuate course. One may imagine the sources of these rivers forming the headwaters of the plateau rivers flowing south-east ward on Ajanta plateau, diverted subsequently northward to join Tapi which appeared, as a result of fault, at a later date and provided a much lower base level and steeper gradient to its tributaries.

Despite extreme dissection, Tapi has developed an alluvial plain, unsurpassed in its fertility, the larger part of which extends to the south of the river. It is a fertile crescent with an agricultural base that has made this region not only self sufficient in food, but also capable of providing raw materials to the industries of the State. The western part of the basin, occupied by Dhule district, suffers from the encroachment of hills and forests and less than half the area is under cultivation, but the eastern part is agriculturally better developed and more than 70 per cent of the land is cultivated. Part of the valley in its western part is forest covered and carries some of the best forests of the State. Jowar and bajra are the principal food crops with a sprinkling of rice and wheat. The dominance of jowar in the more fertile east and that of bajra in Dhule district, having a relatively poor thin soil, is an adaptation to the local climo-edaphic situation. The crop combination includes cash crops like groundnut and cotton; and while Jalgaon is considered an important cotton producing district, groundnut is almost evenly distributed in the basin.

Despite its perennial nature, Tapi has not been harnessed either for irrigation or for power, except in Gujarat where a dam at Ukai has developed a huge reservoir transforming the agricultural landscape of south Gujarat. The troughlike character of the river and the fear of submergence of a large territory have perhaps come in the way of constructing a dam in the river. The contours run almost parallel to the river with the result that a reservoir at any point upstream will irrigate a limited acreage down the dam site by gravity. Canal irrigation is, thus, confined to the harnessing of tributary rivers. The most important irrigation project is the Girna project with a dam across Girna near Malegaon and another pick-up weir about 80 km down near Kasoda. There are also minor irrigation projects on Panjhra and Mosam rivers on the west and Nalganga, a tributary of Girna on the east. The entire Tapi catchment in Maharashtra has a fair spread of tube wells, though wells owned by individual farmers are a major source of irrigation. The total irrigated area in the region does not add up to even 10 per cent of the land under cultivation, and over eighty per cent of the irrigated land depends on the ground water sources, wells and tubewells: The deep and fertile black cotton soil, so typical of this region, supports Jowar, cotton and groundnut even without irrigation.

Groundnut and cotton provide the raw materials for a large number of ginning and pressing units spread all over the region. Besides a few cotton textile mills, there are 200 cotton ginning and pressing units, and over 50 oil mills. Most of these ginning and pressing units are located at Dhule or Jalgaon, but smaller centres like Dhondaicha, Shahada and Nandurbar have also their share of ginning and pressing industry. Khandesh, as a region, is known for its traditional handloom weaving and a large number of handlooms and powerlooms operate even today.

The Tapi basin as a whole carries a well laid out network of transport. Almost parallel to Tapi runs the Tapi valley railway, to the south of the river, with a corresponding road on the northern bank running east-west and opening the way to Gujarat. The Delhi-Agra road and the main branch of Central railway run through the region. The region, unlike many other parts of Maharashtra is well linked with the eastern, western and northern parts of the country and major metropolitan centres of Calcutta, Bombay and Delhi.

The cultural landscape of the region carries an unmistakable imprint of its history. Since the time of the cession of the region to the Muslim rule of 'Khans' right through the Maratha occupation till the advent of the British, it passed hands several times, was overrun by the invading armies and saw scores of hostilities. Being a transition between the territory of Delhi rulers and the Kingdoms of the south, it was a scene of encampment of the armies, a theatre of conflicts between the rival Maratha dynasties in the 18th and early 19th century, and offered easy access or escape routes to the Arabian sea ports through the Tapi valley. Being able to absorb the immigrants from the north and west, the region shows a population composition which abounds in Gujarati and north Indian elements, the former moving up along the Tapi corridor from Gujarat and the latter descending down the Burhanpur gap. The Muslims of Khandesh, like those in Malegaon in Nashik district, trace their ancestry to north India and the *Leva Pattidars* appear to have migrated either from Gujarat or from further north. Added to these facts are languages like Bhili and Ahirani, the former enumerated as the mother tongue of Bhils of the area, and the latter classed as a dialect of Marathi, though there is a controversy about the origin and status of Ahirani and some consider it an admixture of Gujarati, Prakrit, Hindi and Marathi, once the language of Abhir dynasty. Being a part of the former Bombay presidency—Gujarat was also a part-unrestricted migration from Gujarat along Tapi has taken place, but the native traits in the immigrant population are fast disappearing and the immigrants are virtually assimilated in the native population.

Bordered by Satpuda on the north and Western Ghats on the west, one third of the region's population consists of tribals, particularly Bhils, who still live in the fastness of jungles. Dhule, Nandurbar, Malegaon, Jalgaon, Bhusawal, Amalner and Pachora are some of the important towns in the Tapi valley, and Malegaon, a piedmont town of Sahyadri, but administratively in Nashik district, lies in the drainage basin of Tapi.

Dhule (210,927—1981), the district headquarters of the district of the same name, located on the right bank of the river Panjhra, is a medieval city as is suggested by its proximity to Laling fort. In the early nineteenth century, it was the headquarters of a Maratha chieftain, and was later improved during the British rule. The town consists of parallel north-south streets, arranged on either side of the Bombay-Agra road which passes through the centre of the town. The older part of the town occupying

the low lying area is congested and inhabited by economically depressed people. The city has a textile mill with large number of handlooms and a few oil mills that utilize the groundnut produced in the region. With open gutters, narrow roads and many dilapidated houses particularly in the old part of the city, a plan for improvement is most urgently needed. It is an important centre of trade in cotton and groundnut. Jalgaon (145,254—1981), located on the Bombay-Calcutta main Central railway line, is a centre of cotton trade and cotton textile industry. The fortunes of the town fluctuated with cotton trade in the past. With all the advantages like an efficient transport and a rich agricultural base producing cash crops like cotton and groundnut, the town has taken rapid strides in its growth and its population has more than doubled in a span of 20 years. Bhusawal is a railway junction and divisional headquarters of the Central railways, besides having a locomotive workshop. The town can be appropriately termed a transport town. Nandurbar (65,379—1981), the gateway of Tapi valley from Gujarat and the last important town in the valley, before one enters Gujarat, is an important trading centre, known for its chilly market. It has a timber mart and handles trade between Maharashtra and Gujarat. Besides, Faizpur, Chopda, Shirpur and Shahada to the north of Tapi, and Dharangaon, Amalner, Sindkheda and Dondaicha, south of Tapi, are important places handling local trade and catering to the needs of the countryside. A very important place in the Tapi trough is Prakashe, a village in Shahada taluka of Dhule district on the right bank of Tapi. The excavations of Prakashe have revealed significant chalcolithic finds dated to first millenium B.C., and superimposed with iron age deposits.

The Satpudas.—The Satpudas forming the northern border of Maharashtra, beyond Tapi, are a different physiographic unit. With a steep slope, almost a scarp, overlooking the Tapi trough and a relatively gentle slope to the north, the Satpudas form an asymmetrical upland with a general elevation of about 1000 m and stand as a watershed between Narmada and Tapi. The crescent-shaped Satpudas like Tapi, dissected from both sides, north and south, by the tributaries of Narmada and Tapi are reduced to a narrow bone like divide not even twenty-five km wide, though in its western part they are wider and have the semblance of a gently sloping plateau. From north to south, the Satpudas can be divided into three parts:—

- (1) The Akrani hills
- (2) The Kathi Dhadgaon plateau
- (3) The Astamba dongar and its continuation

The Akrani hills.—named after Akrani Mahal, an administrative unit, the Akrani hills are an assemblage of discontinuous hills traversed by the two tributaries of Narmada, Udai and Khat. The area is heavily forested, in which isolated hillocks rise above the general level. The Babasiraj hills in the west, the Udai-Khat divide, rising to 1017 m in the centre, and the Toranmal hill on the east with the maximum height of 1155 m in the vicinity, form this hilly complex. Toranmal is a very small plateau with a settlement and a few forest and P.W.D. bungalows. With the green forests around and a salubrious climate because of altitude, Toranmal well deserves to be developed as a hill station for north Maharashtra. Much of the Akrani Mahal is forested and forests are its principal natural resource. A few settlements and patches of cultivated land are seen on the riverside. These are inhabited by hardworking communities of Varlis and Pavras.

Kathi-Dhadgaon plateau.—Having a general altitude of 3 to 600 m, the plateau is dotted with many tribal settlements, each an assemblage of a few huts. Dhadgaon, a large settlement is the headquarters of Akrani Mahal and is linked with Shahada by road. The entire Satpuda region is the 'Bhil land', though other tribal elements have made inroads in the area. Besides the Bhils, Dhanka, Gamit, Kokna, Naikda and Pardhi are the other tribes. The two talukas in the Satpuda fold, Akkalkuwas and Akrani are largely tribal. Majority of the villages on Kathi-Dhadgaon plateau have a population of less than 500 each, and a large number have a population of even less than 200 persons. The population of Bhils exceeds 3,00,000 in the region, with Gamits occupying a second place.

The Southern Slopes of Satpudas.—The southern slopes of Satpuda are well forested and a considerable part of the area is marked as reserved. The deciduous timber giving forests of Satpuda are well-known in the State. The slopes have receded in response to the erosive strength of the tributaries of Tapi. The river Gomai has been able to penetrate much deeper into Satpuda than the other tributaries pushing back the mountains and rendering them easily passable. East of Rajpipla hills extending upto Borawani hills, a distance of about 160 km, the Satpuda ranges have not been traversed by roads. The transitional zone between Tapi plain and the hill slopes on the north is not only

a physiographic transition, but also one from the culture of the plainsmen to that of the tribal communities, a scene of frequent conflicts between the tribal population and the husbandmen of the plain. The eastern extensions of Satpuda fall beyond the boundary of the State. The mountains have presented such a barrier that from Maharashtra to Gujarat there is no straight road, and one has to follow a circuitous road along Tapi and then to the north to enter Gujarat. Further east, north of Chopda, the Satpura hills, rising abruptly above the plain from 200 to 700 m in a distance of 25 km and then rising like a scarp to 1000 m, are covered with dense teak forests and mixed jungles.

The Purna basin.—Popularly known as Berar, the Purna basin is sandwiched between the Gavilgarh hills in the north and Payanghat in the south. The region is an eastern extension of Tapi valley and Khandesh, though far more fertile. The river Purna emerges from Betul plateau, north-east of Amravati, and collects a large number of tributaries, both from north and south, most of which run almost perpendicular to the main river. The main tributaries of Purna include Pedhi from the left bank and Pili, Bichan, Span and Chandrabhaga from the right. The eastern extremity of the basin is the low divide (350 m ASL) dominated by Amravati plateau and the Chirodi hills in the vicinity of Amravati, that separate the Godavari system and its tributaries from Tapi-Purna basin. One may class Amravati plateau as a peneplain with the hills in the vicinity standing as inselbergs. The basin has three distinct units—

- (1) The Gavilgarh hills
- (2) The Piedmont
- (3) The Purna plain proper.

The Melghat plateau.—Overlooking the Purna valley and forming the northernmost extension of Maharashtra are the forest clad Gavilgarh hills, also known as Melghat, separated from the plain in the south by an east-west fault. The average altitude of the divide line made by the complex of hills is about 1000 m, dipping gently to 500 m in the thalweg of Tapi, and descending steeply to the south—a drop of 500 m in a distance of 6 to 8 km from Chikalda to the foothills. Almost the entire Melghat plateau is drained to the north, except a narrow strip in the south which is drained by a tributary of Purna. Being an extension of Satpudas, the general alignment of the plateau is roughly east-west. The heights on the summit levels linger around 1100 m, with Bairat (1178 m), Chikalda (1103 m), Gavilgarh fort (1066 m) and Nangiri (1120 m)—all attaining virtually an uniform level, suggesting an ancient surface of erosion.

The entire Melghat region is well forested with much of the area occupied by reserved forests. The area receives around 1400 mm of rain, though the distribution of rainfall all over the plateau is not as high. The northern slopes receive heavier rainfall during winter, whereas the southern slopes are virtually devoid of it. Thus, a gentle north face slope with better spaced rain accounts for a far more luxuriant vegetation than in the south. Cultivation is only marginal and confined to riverside flats, close to small settlements. Over 80 per cent of the area of Melghat is under forests. The deciduous forests of Melghat abound in teak and have been reinforced by teak plantations by the forest department, which controls over 3000 sq. km. of reserved forest in Melghat. The main species include Teak (*Tectona grandis*), Tiwar (*Ougenia dalbargioides*), Haldu (*Adina cordifolia*), Saj (*Terminalia tomentosa*), Shisham (*Dalbergia latifolia*), besides a vast variety of dry deciduous trees like Salai (*Boswellia serrata*), Mahua (*Madhuca latifolia*), Tendu and Bamboos (*Dendrocalamus strictus*) occupying large areas. Melghat is rich in wild life and is declared a tiger sanctuary. Panther, wild dogs, sambhar, barking deer, wild pigs and bisons are common animals.

Forestry is the sole industry of Melghat region, afforestation, reforestation and exploitation being managed by the Forest Department which has established a number of forest villages in the midst of forests. Melghat is particularly known for its tribal population of 'Korkus', who, though in the midst of a Gond territory, speak a 'Mundari' language, and to that extent Melghat is an exclave of the Santhal homeland in Mahadeo hills, Bihar and Bengal. They speak 'Korku' and live in small linear settlements with houses arranged on either side of a street. Melghat, though forested, is traversed from east to west by a highway that passing from Amravati and Achalpur ascends on the plateau and runs down the slope in Tapi valley to Dharni, an important settlement. Another principal road is from Akot, reaching due north on the plateau and joining the Achalpur-Dharni road at Harisa located in the centre of the plateau. Chikhaldara, at an altitude of 1181 m, is the principal settlement and hill station. Close to the settlement is the Gavilgarh fort now in ruins, though commanding a beautiful view, and another settlement Motha, a little away. The hill station has a beautiful forest garden which, among other things, grows peaches and coffee. The latter crop occupies more than 200 acres of land. With a permanent population of over 1500, Chikalda is on the way to become an important hill station of northern Maharashtra, though water scarcity for the inhabitants has often posed a problem.

The Piedmont.—Between the hills of Gavilgarh and the Purna plain lies the Piedmont region abutting the scarp face of the Melghat plateau. Besides being a link between the plain and the hills, the towns in this area also promote trade with Madhya Pradesh and offer marketing facilities for the products of the neighbouring state. The Piedmont region produces more of spices and condiments. Akot, Anjangaon, Achalpur, Paratwada and Chandur Bazar are all piedmont towns connected by highways. Achalpur is a historical city and was the capital of the Bahmani and Imadshahi rulers. For long the capital of the province of Berar, it is full of medieval monuments. Chandur Bazar, another town, is famous as a collection and marketing centre of agricultural commodities from and to Madhya Pradesh. Paratwada, at the foot of the hills, is a timber market.

The Purna plain.—The Purna plain proper has the pride of a place in the history and economy of Berar, the name applied to the two districts of Akola and Amravati which occupy the basin. With an extreme climate and a fertile black soil, the region well deserves to be called the cotton yard of Maharashtra. An eastward extension of Tapi trough, appearing like a furrow with a general elevation of about 250 m, the Purna plain proper is extremely fertile and most suitable for the cultivation of cotton. In fact, with more than half the land under cotton in the valley, cotton has become the culture of the region. Jowar, groundnut, pulses and wheat are other crops that are combined with cotton. There are no major irrigation projects except Nalganga project in the western part of the area. Small dams have been built on the rivers joining Tapi from the south. These include Katepurna and Morna in Amravati district and Nirguna and Gyanganga in Akola district. Despite the fact that much of the cultivation of cotton is still 'jirayat', Berar grows more than ¼ of the total cotton produced in the State. Ginning and pressing of cotton is the main industry of the region. While the pressing and baling units, numbering about a hundred are uniformly spread all over the region in larger settlements, the spinning and weaving mills are centred in large towns, two in Akola, one in Badnera and another at Achalpur. Ready availability of cotton, good transport and accessibility to markets have been factors in the growth of these textile units. Oil mills form the second important most industrial units in the area centred in most of the taluka places and larger villages.

The fertile agricultural land growing cotton and other food crops, and supporting agro-based industries has made Berar an enviable region of the state. The Bombay-Calcutta branch of Central railway roughly cuts the region into two halves. Akola-Washim-Hingoli and Murtajapur-Yavatmal in the south and Akola-Akot-Khandwa and Murtajapur-Daryapur-Achalpur in the north are the transverse routes. Most important places are located on the Bombay-Calcutta Central railway. Amravati and Akola are the two principal towns. Amravati (261,387—1981), the largest town of the region is relatively modern and dates back to the eighteenth century. For its late origin, the town has grown well. The old town, inside the wall, suffers from extreme congestion; the expansion outside the wall is moderately spacious. Being the principal cotton mart of Berar, it bristles with trading activity and has a few cotton ginning and pressing and a few oil mills. Akola (225,402—1981), the second largest town of the region, located on the main Central railway, owes its importance to its location and the cotton trade. A medieval town, its fortunes have fluctuated with the cotton trade and prices of cotton.

Berar, a part of Maharashtra, has its own typical lingo. Being on the border of Hindi speaking Madhya Pradesh and having been ruled for long by Muslim rulers, the region has been exposed to a variety of cultures, and, in the process, evolved its own, which may be termed a Varhadi culture, a culture shorn of superficial sophistication but deriving its elements from the basic premises of humanity and goodwill, and bonhomie and warmheartedness towards fellow beings. Majority of the population consists of 'Kunbis', a land-owning and cultivator class. The Kunbis as a caste are comparable to Marathas, and the higher-ups among them even intermarry with the latter. Devoid of the urbanity of metropolitan region and dipped in the culture of the soil, the people of Berar represent a sturdy, hardworking stock who have brought prosperity to this region.

Wardha Wainganga basin.—Unlike the rest of Maharashtra, Wardha-Wainganga basin, east of 79° E longitude, falls in a very different lithologic province covering a large span of time, ranging from the Lower pre-Cambrian to the Pleistocene. Much of the area is underlain by granite-gneisses or granite rhyolite sequence, exposed all along the Wainganga valley with local variations of basic or ultrabasic rocks and the exposures of Dharwar system in the north. A large enough patch in Penganga valley, called Penganga beds, consisting of quartzites, comparable to Kaladgis, borders the coal beds of lower Gondawana in Umreth and the adjacent series. On the margin of the Trap is exposed the infra-Trappean lameta beds. Nagpur forms the easternmost extension of the basaltic plateau, where the Trap thins out

and forms the capping of the adjacent Burdi hill which has a crystalline base. Besides cultivable lands, minerals and forests form other important economic resources of the region. The development of the basin is not uniform and is confined to more accessible and agriculturally fertile areas. A large part, particularly in Chandrapur and Bhandara districts, is yet inadequately developed. As anywhere else, the forested tribal areas of Chandrapur and Bhandara have attracted the least human effort and the tribal folks live a life of their own, dipped in their beliefs, traditions and the age-long clan organization.

Depending on the physiography, the region can be resolved into a number of sub-regions. These are :—

- (1) Northern border upland
 - (a) Arvi upland
 - (b) Ramtek upland
- (2) Wardha-Wainganga plain
 - (a) Nagpur plain
 - (b) Upper Wardha plain
 - (c) Lower Wardha plain
 - (d) Wardha-Wainganga divide
 - (e) Upper Wainganga plain
 - (f) Lower Wainganga plain
- (3) The Eastern hilly area.

Arvi plateau.—Between the source waters of Wardha river on the west and Kanhan on the east, stands the Arvi upland with an average altitude of over 450 m. The plateau is dissected on all sides by the tributaries of Wardha and reduced to a 80 km wide upland traversed only by Nagpur-Amravati road. The railway lines, both the main Central railway and the one going north to Betul from Nagpur, have avoided this broken land, following a circuitous road. The margins of the plateau carry scrub forests and the top, with its poor soil, has widely spaced villages. Kondhali, Koranja and Talegaon are the important settlements with their weekly markets. Beyond Wardha in the north is the Betul plateau of which the Arvi plateau is an outlier.

The Ramtek upland.—The Kanhan river passing close to Nagpur separates the Ramtek upland, northeast of Nagpur, from the Arvi plateau in the west. Many of the tributaries of the river Wainganga, Pench and Dawanthari river emerge from the Ramtek hills. With a general height of over 400 m, the area carries a dense cover of mixed dry deciduous forests which form one of the principal resource of the region. The Nagpur-Jabalpur road passes through the region and is the principal highway that promotes inter-regional contacts. Building of a tank at Ramtek on Sur river, and the development of canal irrigation have made a large stretch of Nagpur plain prosperous. The Ramtek hills are the outliers of Ambagad hills further east, though all are the offshoots of Satpuda ranges. The plateau is known for its scenic beauty and relatively well preserved forests. Ramtek, lying on the outskirts of the plateau, is an important centre, linked with Nagpur by a railway line. The place has a religious significance and is associated with the legendary King Ram of the great epic *Ramayana*.

The Nagpur plain.—The most important and economically the most developed sub-region of Wardha-Wainganga basin is the Nagpur plain. Formed by the valley of Kanhan river and its tributaries, the general height of the plain is about 250 m ASL. Nagpur is the apex of the plain beyond which to the north Satpura ranges make their appearance in Khamarpani plateau. In the south, it is confined by the Wainganga river and its tributaries and the Umrer hills. Unlike Western Maharashtra, winter crops assume importance in the agricultural landscape of the area. And though jowar retains its importance as the first crop, wheat appears as an important cereal and pulses become uniformly noticeable. Agricultural holdings are large, and at least 2/3 of the total holdings in the Nagpur plain are each over 5 acres, of which about 1/5 are even larger than 15 acres. A special feature of the South Nagpur plain is the cultivation of chillies. Cotton remains an important fibre crop.

Orange cultivation in Vidarbha, known all over the country, is highly concentrated in Nagpur district which alone has more than 17,000 acres under orange which is more than half the total area in Vidarbha. The main harvest 'Mirg' is between February and April accounting for 60 per cent of the total production and the remaining 40 per cent is produced during 'Ambya' i.e. between September and January. The total production of oranges in Nagpur district is estimated at 100,000 metric tons. The

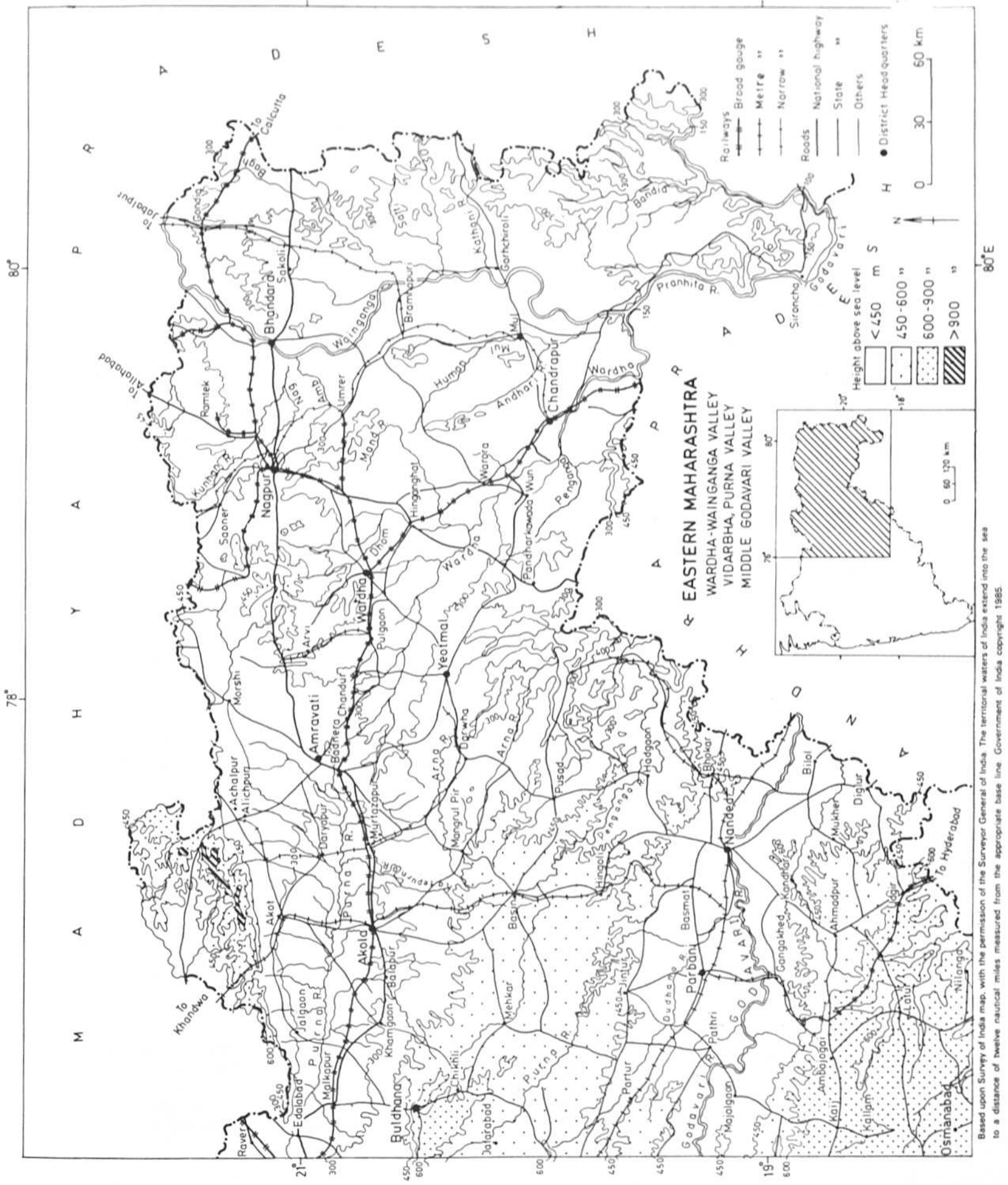
city of Nagpur has the distinction of having one of the earliest textile mills in the country which started in 1877 using local cotton. At present, the city has two spinning and weaving mills. The traditional handloom industry is usually run on a co-operative basis. The weavers are the members of the traditional Koshti community, or Momins, the immigrant Muslims. A number of other industries particularly machine and general engineering are located in Nagpur or nearby places. Ginning and pressing units form a major component of textile industry and are located at several places. Other industries include oil mills, foundries, ceramics, paints, soap and bidi-making and canning of fruits.

Nagpur (1,297,977—1981), the third largest city in the State, is a late medieval town, founded by the Gond Kings and subsequently promoted by the Bhosales, a ruling Maratha dynasty, and was the capital of the erstwhile Central provinces for long. The rapid growth of the town is attributed to its central location in the country, almost midway between Calcutta and Bombay. The old town grew to the south and east of the Sitaburdi fort, in areas lower than the western part which developed into civil lines during the British rule. The railway line separated the old town from the civil lines. The main business thoroughfare, Hanspuri road running east-west divides the old city into two parts. At the eastern end of Hanspuri road is *Itwari bazar*, initially the site of Sunday market but now thronged with permanent and semipermanent houses and shops teeming with life. The 'civil lines' developed during the British period is a much later addition to the town. During the hey-day of the city, a Legislative assembly and a High Court were added to the town, giving it an aura of a capital city, the semblance of which it still retains. Known for its orange market and textiles particularly those manufactured by the Koshti Community, the city is an important trading centre. Administratively, the monsoon session of Maharashtra Legislature is held here every year besides there being a permanent bench of Bombay High Court. With a University, a large number of Colleges and many dailies and weeklies, Nagpur may well claim to be one of the literary centres of Maharashtra. Being better exposed to national cross currents and having direct contact with Hindi speaking Madhya Pradesh of which it was a part, the town is more receptive of the ideas emanating from even outside the State. Being close to Wardha, the seat of Mahatma Gandhi's 'ashram', and the scene of a number of national conventions of the Indian National Congress, its share in the independence struggle and claim to eminence is far greater than can be imagined from its contemporary economic status. Kamptee, a cantonment town, is another important place close to Nagpur. Khaprakheda and Koradi, the two thermal generating stations close to Nagpur have come into prominence recently.

The upper Wardha plain.—This is the plain formed and drained by the river Wardha, a tributary of Wainganga, that emerges from the Betul plateau north-east of Nagpur. The sub-region includes much of Wardha, Yavatmal and part of Chandrapur district. With an average altitude of about 250 m, the area is drained by a large number of tributaries of Wardha, the chief among them being the river Wunna. Close to Chandrapur, about 25 km. to the west, Wardha is joined by another of its tributaries, Penganga. Lying between the Umrer hills on the north-east and Yeotmal plateau on the south-west, it is a rich fertile plain, covered with lime rich black soil. Locally the soils are classified as *Kali*, *morand*, *khardi*, and *bardi*, in the order of their richness and fertility. *Khardi* and *bardi* are the inferior soils. These are shallow occupying the margins of the plain. About $\frac{3}{4}$ of the area of the plain is under cultivation, cotton being the most important crop of the region followed by jowar, grown as rabi crop. Kharif jowar is usually grown as a fodder crop. The cultivation of hybrid jowar has, of late, picked up in the area. The Wardha plain is an important producer of wheat, which in some parts is as important as jowar. The region is also known for good breeds of cattle, of which the 'Gaolao' breed is most widely reputed. The rural population is distributed among small villages, majority of whom have a population of less than 500. With the support base of cotton as raw material, there are three textile mills in the area, one at Pulgaon and the other two at Hinganghat. Oil mills are other important industries besides the usual ginning and pressing units. The area is covered with a well laid out transport network with Wardha as the nodal point from where the roads radiate in all directions.

Wardha, the principal town of the region, lying on Bombay-Calcutta railway was started in the late 19th century, and came to occupy an important place in national affairs with its selection by Mahatma Gandhi in 1934 to establish his 'ashram', that became the focal point of India's independence movement. Close to Wardha is Pavnar which was the site of the ashram of the late Vinoba Bhave, a saintly disciple of Mahatma Gandhi. A number of other social institutions founded by Mahatma Gandhi are still in Wardha. The place is an important trading centre of Vidarbha. Hinganghat, lying on the Nagpur-Hyderabad railway line, a taluka headquarters, from where cotton was regularly exported to U.K. during the British rule, thrives on its cotton trade even today. Pulgaon is another cotton trade centre.

Fig 59



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1965.

The Lower Wardha plain.—While the upper Wardha plain is an agricultural country, the lower part of the Wardha basin has the distinction of having the only coal-belt of the State, and a considerable forest area. Traversing the Warora, Chandrapur and Rajur tahsils of Chandrapur district, the region is rich in minerals and provides the corridor for Wardha-Kazipet-Secunderabad railway line, the transport artery that collects the minerals and forest products of the region. With a general altitude of about 170 m ASL and not a very spectacular relief, the river plain is well utilized for cultivation, but away from the flood plains of the Wardha and its tributaries the land still remains under forests reserved or protected by the Forest Department. The northern part of the plain occupied by Warora tahsil has over half the area under cultivation, but the percentage of net sown area progressively decreases further south and east. Chandrapur taluka has only 1/3 of the land under cultivation, and in Sironcha, extreme south of the Chandrapur loop, even less than ¼ of the area is under crops. Agriculture and forests are complementary and low acreage under cultivation is invariably accompanied by a high percentage of land under forests.

Food crops claim most of the cultivated land. Rice is the principal crop occupying one third of the cropped area, but jowar attains equal importance in areas not amenable to paddy cultivation. Pulses are significant, and in some pockets particularly in the western part—Rajura taluka—cotton makes its appearance. Rice and jowar, each occupies about 30 per cent of the gross cropped area. There are, no doubt, regional variations. For instance, the percentage of jowar rises to as high a level as 45 per cent in Chandrapur taluka. A special feature of jowar cultivation is *Ringni* jowar, a variety grown in rice fields after the harvest of rice. Farming is labour intensive and machines are absent from the agricultural scene. In the absence of the use of machinery and mechanical energy, draft cattle are grown and domesticated. The 'gaolao' breed of Chandrapur is a good breed of cattle which is being improved. About 17 per cent of the cultivated land is under irrigation, three-fourths of which enjoys tank irrigation. Tank irrigation is an important feature of cultivation in both, Chandrapur and Bhandara districts. A tank is either a large lake or a small pond locally called 'boris'.

The Wardha valley accounts for almost the entire amount of coal produced in the State. The coal beds associated with Gondwana deposits of the upper Carboniferous period occur in the following areas:—

- (1) Chandrapur-Ballarshah area
- (2) Warora-Manjri Coalfield
- (3) Sasti-Rajura Coalfield
- (4) Rajura-Wun Coalfield
- (5) Ghughus-Telwasa Coalfield.

The total reserves of coal in this belt, though not always of good quality, is estimated at 2306 million tons. The largest deposit is seen in the Ballarpur colliery, east of Chandrapur. The annual production, albeit variable, is roughly 500,000 tons.

The lower Wardha basin, in which Warora, Chandrapur, Rajura, Ballarshah and Dabha are located, was traditionally known for its *tasar* silk, cotton fabrics, brass work and ornaments. These indigenous industries have since declined and are replaced by more modern ones making use of machine and electric power. The most important of these is the pulp and paper industry at Ballarshah, depending for its raw materials on the forests of the region. The forest resources of the region support several paper mills. Another mill, hardly 100 km south of Ballarshah, is located at Sirpur in Andhra Pradesh. The melting of iron-ore, an indigenous industry, is, of late, modernized and a joint venture, with the public and private capital, known as 'Electrosmelt' has been established to utilize the local iron ore. The factory, however, has still not come out of the teething troubles and shows signs of a sick unit. Glassware and ceramics are the other industries of the region.

The people of the area are largely Hindus but the adjacent Wardha-Wainganga interfluvium and the Wainganga plain form the 'Gondland' of Maharashtra with a sprinkling of population of other tribal groups. A large number of tiny villages is a distinctive feature of the rural landscape of the region. The Chandrapur district has the largest number of villages (2,840—1971) in Maharashtra having a rural population of 14,73,037 in 1971. This may not be representative of lower Wardha plain, but gives an idea of the village size. About seventy per cent of the villages have a population of less than 500. There are a few towns strung along rail and roadways running north-south.

Chandrapur (Population 115,352—1981), the district headquarters of Chandrapur district, is a town of medieval origin founded by a Gond King in the mid-fifteenth century, and walled subsequently. The wall and the battlements on it are still intact, and speak of the past glory of the Gond capital. The town lies on the coal bearing beds and its surroundings have been badly excavated. Surrounded by forests and greenery on the east, it provides an attraction to a casual visitor. Inside the walled city, are a number of temples in the midst of congestion, but outside are a few tanks, the most important of them being the 'Ram tank'. Warora, a mining town, more specifically a colliery town, is a taluka headquarters besides being an important trading centre for cotton with a ginning and pressing mill.

Ballarpur, also known as Ballarshah, is a coal mining town with the country's largest timber market. The colliery in the vicinity and the vast forest resources, together with its location on Nagpur-Madras railway line, have given the town an unparalleled importance in Chandrapur district. Local availability of fine quality china clay has induced the development of pottery and ceramics industry. A large paper and strawboard mill, thriving on the forest resources, has given the town a well deserved status. Added to these raw materials is the large thermal power-house at Ballarpur which ensures adequate energy for its industries. Despite a small population (61,389—1981), the place is by far the most important growing industrial centre of the region.

The Wardha valley and the associated plain, form the transition between the lithological trap province and the black cotton soil of Maharashtra on the west and the Peninsular gneisses in Wainganga valley and the hill ranges on the east, and shares the characteristics of both. With a well developed communication network and its mineral and forest resources that form the industrial base, it promises to be the most important region of Maharashtra in the future.

Wardha-Wainganga interfluvium.—The Wardha-Wainganga *doab*, traversed by a number of parallel and sub-parallel tributaries, like Jodam, Bokardoh, Gondani, Human and Kalhar in the north joining each other to form Pathri, Mul, Andheri and Erai in the south, as if the entire area is furrowed north-south, is largely wooded except for a few kilometres on either side of the rivers. The principal transport route, Nagpur-Chandrapur railway line and the road follow the Mul valley, and the entire area particularly the northern part is studded with tanks. The practice of tank irrigation on a large scale suggests the low configuration of the divide indicating that the region is a virtual peneplain. North of Chandrapur-Mul-Gadhchiroli road, the land drained by Jodam, Bokardoh, Human and Mul river is described as the lake district of the region. With an altitude ranging from just over 200 m around Nagbhir to 180 m around Mul, in a distance of about 1000 km, the gently sloping land practices flow irrigation on a large scale from the tanks built across small rivulets and sometimes even a large stream, as in the case of Asola Medha tank built across Jodam river. Despite the practice of irrigation on a large scale, the forest cover is still predominant. A thin soil cover, a dissected land or a hilly terrain have been left untouched. In fact, the colonization of this area itself appears to have started late and in the process farming has not made as much of a dent in the forests in this part as in many other areas of the State. Adequate irrigation facilities have made the Wainganga valley and the Wardha-Wainganga doab the rice bowl of Chandrapur district. The two tahsils, Brahmpuri in the Wardha-Wainganga doab and Gadhchiroli east of Wainganga, together produce sixty per cent of the rice of the district. Tank irrigation so typical of the area suggests not only a keen terrain perception of the tribal communities but also the skill they used in building these tanks most of which were built by a caste called 'Kohlis'. The encouragement for building irrigation tanks came from the Gond Kings who allowed the rent-free tenure of the land irrigated by a tank for a specific period. This system was known as 'Tukum'. The tanks built hundreds of years earlier are still widely in use though many of them have been silted and are in a state of disrepair and no longer in use, particular in Sironcha tahsil, in the south of the district.

Brahmpuri, Talodhi and Sindewahi are large villages and serve as local market centres. Mul, another large village on Chandrapur-Gadhchiroli road, in the midst of prosperous agricultural land, is a rice milling centre.

Wainganga plain.—The river Wainganga, emerging from Chhindawara plateau in Madhya Pradesh follows a north-south course in Maharashtra. Making some meanders and bulges, the river traverses the districts of Bhandara and Chandrapur, before it is joined by Wardha from the west, to be called Pranhita in its lower course, where it forms the boundary between Maharashtra and Andhra Pradesh. Throughout its entire length, in Maharashtra, the river flows in a granite gneissic terrain, in a very ancient topography and encounters in its course the metamorphic Dharwars in Bhandara district which

form the principal iron bearing rocks of the area. Flowing at an average altitude of less than 200 m, with an imperceptible slope in its longitudinal profile, the river makes a kilometre wide sandy bed with the stream appearing as a trickle during the dry months. It is joined by Kanhan on its right bank on the eastern extremity of Nagpur district, and Kabragarhi from left near Awalgaon in Chandrapur district. Besides these two, there are a large number of tributaries running transverse to Wainganga which forms a dendritic system.

From Bhandara in the north to Brahmpuri, Gadchiroli and Ashti in the south, the river plain, not exceeding 15 km at any point, is a scene of moderately intense agricultural activities; and beyond this narrow plain, on the outer margins, the land more specifically the areas which are hilly and undulating are covered with forests. Despite an intense agricultural activity in the flood plain of the river, the overall percentage of land under cultivation is relatively low if one considers a wider area between the adjoining major divides. A low percentage of net sown area in most tahsils of Bhandara and the eastern tahsils of Chandrapur prove this point. In no tahsil the cultivated acreage exceeds half the total geographical area. Bhandara, Gondia and Sakoli tahsils of Bhandara and Brahmpuri and Gadchiroli tahsils of Chandrapur district have 50, 50, 31, 38 and 18 per cent of their land under cultivation. Of these five talukas, Brahmagiri and Gadchiroli form the core of Wainganga plain. Over half the cultivated area of the region is under rice, and jowar is the second important cereal. The percentage of rice increases in the east and south, in Gondia and Sakoli talukas of Bhandara district, where it is as much as 80 per cent. As one moves south, the area under cultivation itself dwindles and shrinks to a mere 6 per cent in the extreme south. The northern part of the plain, coinciding with Bhandara taluka of the same district is agriculturally more prosperous with more than half the land under cultivation of which rice claims more than three fourths. The northern Wainganga plain could, therefore, be described as agricultural and the southern part as forested.

Well drained flat topography with rice fields all over, developed means of irrigation and an effective network of transport have made the northern—one may also call upper—Wainganga plain a dependable agricultural region where the rice crops seldom fail. This sub-region has a very dense population, and settlements, large and small, dot the entire landscape with small towns like Jam, Tumsar, Khamtalai and Sakoli located almost at equal distances from Bhandara, the district headquarters. The northern peripheral part of the Wainganga basin, almost on the border of Madhya Pradesh, is known for its manganese deposits associated with the Pre-cambrian Sausar series. The manganese is found in the rocks 'Gondites' which are the manganiferous deposits of Dharwar age.

The three important areas where manganese is mined are—

- (1) Dongri Buzurg,
- (2) Sita Saongi,
- (3) Chikla.

The Dongri-Buzurg and Sita Saongi deposits are fairly thick while Chikla mines have a mean thickness of eight feet. The total reserve of manganese in the area is estimated at 45 million tons, with an average of 30 to 40 per cent manganese content. Besides manganese, chromite deposits are worked at Pauni.

Despite the apparent backwardness, the upper Wainganga plain is relatively a prosperous region with adequate forest, mineral and water resources, all of which are being exploited to the advantage of the region. The fact that no large town exists, or that the area was the home of Gonds, a tribal community of Central India, hardly bears any relation to its economic growth and level of development. For one thing, it does not suffer from drought, severe famines, over-population or flood, and for the other, its mineral and forest resources give it the status of a resource—rich region awaiting greater development.

The region has not attracted industries, though there are indications that some major industries may appear in the area in the not too distant a future. An automobile industry is very much in the offing.

Bhandara, the main urban centre of the area is a medieval town known for its brass industry promoted and developed by the artisans who migrated here during the medieval period. Gondia, after Gonds, is another settlement which is located on the Central railway. Located in the midst of forests, the place is a centre of timber trade and distribution of other forest produce. Manufacture of 'bidis' and their export, and collection and shipment of *tendu* leaves, the raw material for bidis is the common enterprise. Processing of crude lac produced in the neighbouring forest is an additional source of income to the area. The industrial centre of the region is Tumsar, which, besides having a ferro-manganese plant, has a paper mill, a few saw mills and many small industrial units making 'bidis'.

The Lower Wainganga Lowland.—This is the plain associated with Wainganga, south of Brahmgiri till its confluence with Wardha, having an average altitude of 200-250 m ASL rising gently on either side of the river's flood plain, and interspersed with inselbergs in the peripheral zone which appears a veritable peneplain. The saucer-shaped basin is bordered on the east by Gadchiroli hills and Surajgarh hills. The eastern half of the plain is poorly developed and occupied by a large number of zamindari estates granted to individuals during the British period.

A word must be added here about the tenure system in the area which has evolved over several hundred years. The land passing hands from the Gond Kings to the Maratha rulers and subsequently to the British, witnessed changes in tenure system in quick succession. The Patels appointed by the Marathas were substituted during the British period by the 'Malguzars', after the system prevalent in the North-West provinces. The Malguzars did not always have the proprietary rights and in some cases the tenant farmers were granted the proprietary rights leaving only the right of rent collection with the zamindars. During the period of resettlement in the early years of this century, the British Government introduced a different form of tenure in the areas east of Wainganga, coinciding with Gadchiroli and Sironcha taluka. Because of the diversity of terrain and the forest cover, these areas were put under zamindars who had the sole proprietary right over land and had to pay a quit rent in the treasury. Thus, the eastern part of Chandrapur district, incorporating Chandrapur, Warora and Rajura tahsils had a malguzari and ryotwari system while the areas east of Wainganga including Gadchiroli and Sironcha had a zamindari system of tenure.

The eastern part of the Wainganga plain is thus full of zamindari estates which for a long time hindered the agricultural development of the area. These estates, however, no longer exist and the system of proprietary rights to the owner has been universally introduced.

Leaving a widely cultivated narrow ribbon along the river, much of the area particularly east of Wainganga is forested. Agriculture is confined to the valleys of the river Kobragarhi and its tributaries, growing only rice and maize. There are no large villages and most of the rural settlements are represented by a cluster of huts. There is only a solitary road traversing Gadchiroli taluka from west to east going to Drug and another from Brahmpuri runs as far east as Kurkhera. The main road runs north-south along the left bank of the river Wainganga.

Gadchiroli lying in the meander belt of Wainganga, and Armori further north, hardly six km from the river Wainganga, are the only important places. The area, particularly the part lying in Gadchiroli tahsil, has more than a third of its population composed of scheduled tribes, largely the Gonds followed by Pardhans in number. The eastern margin of the plain touching the Ahiri highland has a very high percentage of land under forest, with a few patches of very dense reserved forests.

The Pranhita-Godavari-Indravati Loop.—Enclosed between Pranhita (name given to Wainganga after its confluence with Wardha), on the west, a short stretch of Godavari on the south, and Indravati on the east, is the forest covered upland, consisting of Ahiri hills, Dewalmari hills and Sirikonda (highest point—527 m) from north to south. Much of this area is included in Sironcha tahsil of Gadchiroli district, a district lately carved out of Chandrapur. This southernmost part of the State, bordered by Adilabad and Karimnagar districts of Andhra Pradesh in the south and Bastar district in the east, is located in the far-flung corner of the State. Much of this area is under forest inhabited by the tribal community of Gonds living in small villages and huts.

With less than one tenth of the land under cultivation, (forests accounting for over 80 per cent of the utilization of land) rice is the principal crop, and jowar makes its appearance on highland. An idea of the land utilization and crop pattern can be had by examining these economic aspects for Sironcha tahsil. The tahsil has 84.25 per cent of the land under forests and 5.66 per cent of the land is classified as net sown area. Of the small fraction of land cultivated, rice claims over 60 per cent and jowar about 25 per cent, the remaining land is given to maize and oilseeds.

Forests form the main stay of the economy of the region largely inhabited by Gonds and other minor tribal groups. With 12 to 1500 mm of rain depending upon the height and aspect, the region has a luxuriant growth of forests. With the exception of December, there is not a single month when the region does not enjoy at least 10 mm of rains. This explains the generation and growth of forests. The forests of Sironcha are classified as southern tropical dry deciduous. A mixed growth is the most

common type, though by management, the forest department of Maharashtra has been able to develop exclusive stands of forests. In the mixed forests, the most common species are *ain* (*Terminalia Tomentosa*), *Mohwa* (*Madhuca latifolia*) and *aonla* (*Emblca officinalis*). Besides, there are smaller patches of *haldu* (*Adina Cordifolia*), *Semal* (*bombax malabarica*), *Salai* (*boswellia serrata*) and tiwas. In parts where the local topography or edaphic condition aggravate the moisture stress conditions, palas (*butea monosperma*) is common and acacia catechu makes its appearance in extremely poor and rocky soils. Bamboo (*dendrocalamus strictus*) grows in the mixed forest as an undergrowth and also as exclusive stands close to water courses. The bamboo forests are extensive and widely spread, though their quality may differ.

The forests of eastern Maharashtra and particularly those of Chanda district have a reputation for good quality teak. The teak trees in the region range from 120 to 150' in height and 8 to 9' in girth. The best quality teak is exploited from 'Allapalli' forests which because of their luxuriance are designated as the 'glory of Allapalli'. Allapalli teak is considered the best quality teak in the country, comparable to Burma teak. Besides teak, *bijasal*, *sisam*, *saj*, *haldu* and bamboo are other economically important trees which occur abundantly in the region. Forests are an important source of revenue for the State Government which amounts to a couple of crores of rupees each year.

The most characteristic aspect of the region, besides its forest wealth, is its tribal population, majority of them being 'Gonds', who ruled over a large tract of territory in Central India during the medieval period. Besides having their territorial claims and well fortified capitals, the Raj Gonds also owned zamindaris after they were stripped off of their original titles. Some of these zamindars even revolted during 1857 mutiny against the British and continued dominating the area. In fact, in Sironcha taluka the tribal population accounts for more than half the population. The Gonds who number more than 90 per cent of the tribal population are more backward than the other tribal groups and many of the sub-tribal groups like Madia Gonds still live in a traditional and primitive style. The Gonds, as a group, either practise agriculture or work as agricultural labour. They have many sub-groups of which four (Rajgonds, Madia, Dhurve and Khatulwar Gonds) are important. All these groups speak Gondi which is influenced by the bordering languages like Marathi, Hindi or Telugu. The Rajgonds occupy the trans-Wainganga region while the Madia Gonds live in the remotest jungles. By and large, the Gonds are animists, though Rajgonds have adopted many of the rituals of Hindus and consider themselves of Rajput origin. Pradhan, Gowari (a caste of graziers) and Kohlis are other important castes among the aboriginals.

Bilinguism is the important cultural trait of the population in Wainganga plain, and half the population of the southern Wainganga plain speaks 'Gondi' as their mother-tongue. Telugu is the second important language, being the mother tongue of 36 per cent of the people, while Marathi is spoken by 15 per cent of the people as their mother tongue. Most people show acquaintance with, and sometimes even proficiency in, all the three languages. In the district of Chandrapur and Gadchiroli, as a whole, three fourths of the people speak Marathi as their mother tongue. The Sironcha taluka, the Indravati-Pranhita-Godavari loop, is an area of cultural transition as can be seen in the suffixes of the place names like palli, gudian, peta and puram, all of which denote a telugu origin.

A system of irrigation, more appropriately the storage of shallow water for paddy cultivation, called 'gata', consists of timber dams in the streams one above the other, enclosing the water of the stream and letting it spread on the gently sloping land around. Thus, a large sheet of shallow water is formed in which rice is grown. The system aims at doing away the need of irrigation during dry spells, though gives only low yields.

Forestry is the principal trade of the area with forest department dominating the scene. Exploitation, transport and sale of timber and other forest products like bamboo, *tendu*, lac and gum, certain fruits and grasses—all enter into the regional economy. There are not many transport routes except the forest roads meant for the transport of timber. Allapalli to Sironcha is the most important all weather motorable road handling greater volume of forest goods traffic, besides another road running between Allapalli and Muramgaon.

Most of the large settlements are located along the road to Sironcha which is a taluka headquarters. Ankisa and Asarali are important villages on the bank of Godavari growing, among other things, a very fine quality tobacco.

The Eastern hills.—The easternmost extremity of Maharashtra consists of a series of hills, about 400 m ASL, that form the divide between the Godavari and Mahanadi water systems. From north to south, Nawegaon hills, Gadchiroli hills, Surajgarh hills and Ahiri hills appear well aligned. The divide between the head waters of Seonath, a tributary of Mahanadi and those of the tributaries of Wainganga is considerably lowered and the water parting is not so sharp, a mere swell punctuated by inselbergs which sometimes rise to more than 500 m. ASL. The area is densely wooded and except where the inter-state routes traverse, the administrative boundaries are not so well defined. In the southern part, a number of rivers moving due south from the plateau join Indravati river.

A tribal belt where the inter-state border becomes obscure, the economy rests on the exploitation of forests, in which the local inhabitants benefit only to the extent of getting employment. The tribals have neither the enterprise nor the resources to participate in the practice of forestry. Depending largely on subsistence farming, rearing of pigs and collection of forest produce, for the Government or Government appointed contractors, is their sole occupation. Except the settlements which are located on the road side, the rest of the villages are sleepy and are seen only as isolated groups of huts. The northern part of this region has experienced the impact of industrialization, as the iron mines of Durg, and one of the large steel plants in the public sector located at Bhilai are hardly 75 km from the border, and have exercised a pull causing the migration of the tribal people and imparting them a greater degree of mobility. The southern extension of this hilly tract bordering Bastar hills in Bastar district of Madhya Pradesh, though devoid of intra-regional transport routes, is traversed by three east-west roads, the Bhandara-Durg and Bhilai road, Gadchiroli (in Chandrapur)—Rajhara (M.P.) route, and the Sironcha-Jagdarpur road, all meant to collect the forest produce except the Bhandara-Durg road which is a stretch on the national highway from Bombay to Calcutta via Nagpur.

It is an irony that despite the rich deposits of iron ore and managanese, occuring in the hilly and forested belt inhabited by India's largest tribal group, the Gonds, the latter hardly benefit from the economic growth springing from the development of mines, power generation and industries, in the face of crafty plainsmen and city dwellers, who, with the knowledge of modern managerial techniques and greater enterprise, keep the tribals at the periphery, working as unskilled manual labour on daily wages. What is pathetic is their plight, away from the freedom and fastness of the jungles, having a life of lowly wage earner, apparently assured of an employment, but without being able to better their life.

□ □

CHAPTER XVIII

THE BOMBAY METROPOLITAN REGION

Centred around the city of Bombay, the Bombay Metropolitan region includes Greater Bombay and the outlying areas which have been perceptibly influenced by the physical growth of Bombay, and are undergoing rapid changes in their economic activities, space organization and demographic characteristics. The region is also an administrative entity for the purpose of planning, and has been delineated by Bombay Metropolitan Authority after annexing a few adjacent talukas of Thane district in Greater Bombay.

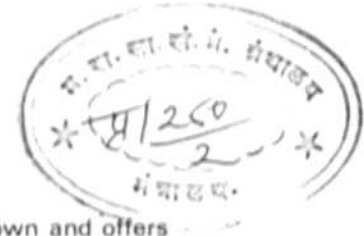
The city of Bombay, no doubt, remains the core of this region. The city, originally a cluster of seven islands, was ceded to the Portuguese in 1534, by Sultan Bahadur Shah of Gujarat, and later on to the British Crown in 1665, under a marriage treaty following the marriage of Charles I of England with Catharina of Portugal. The growth in the seventeenth and early eighteenth century was negligible, and it was not till the middle of the eighteenth century that the signs of development started appearing and a small town grew around the castle that was built by the East India Co. Decades of development and reclamation resulted in the expansion of the city area to 26 sq. miles in 1950, to which the area of the Bombay suburban district was added in 1951, bringing a total area of 90.8 sq. miles, called Greater Bombay, under the municipal corporation. In 1956, 26 more villages were added and the area of Greater Bombay increased to 169 sq. miles. With the growth of the city more and more areas on the fringe were annexed and today Greater Bombay covers an area of 603 sq. km.—

Metropolitan region	..	3,965 sq. km.
Greater Bombay	..	603 sq. km.
Bombay city	..	68.71 sq. km.

While the Bombay Metropolitan region was brought into existence by a Government notification in 1967, the Greater Bombay district has existed ever since the limits of the municipal area was extended beyond the island. This is the area administered by Bombay Municipal Corporation. The term Bombay city is used here for that part of Greater Bombay which coincides with the island of Bombay.

Greater Bombay (8,202,759—1981), the largest city of India, is a great metropolis, a giant among the cities, with all its economic strength and formidable social problems. Primarily a port, it grew into a large industrial centre, a large port, and a large financial and banking centre. Initially a centre of textile industry, the city has attracted all kinds of industries during the last fifty years making it the largest industrial agglomeration in the country. Handicapped in its peripheral expansion, surrounded as it is on the three sides by sea, it grew linearly from the island northward, along the railroads. The unplanned development led to the growth of the industries not only in certain specific areas but all over, spawning unabated even in the suburbs. The result has been a mixture of residential and industrial suburbs existing side by side.

A regular stream of migrants from the rural areas, to fill in the gap in the labour supply created by accelerated economic growth of the city and coming up of new industries, not only strained the civic amenities which, at any rate, were inadequate, but created an unprecedented housing problem, as it appears, beyond redemption. Today, the city carries a large number of squatters colonies locally called 'Jhopadpattis' which seem to have acquired a permanence and, in the process, disfigured the town. A half hearted attempt on the part of the Corporation resulted in the development of a small township across the Thana creek. But, this is too inadequate. According to one estimate about 45 per cent of the population of Greater Bombay lives in slums. This explains the pathetic state of affairs in Bombay, in so far as the question of housing and civic amenities goes. The dirt and squalor of 'Dharavi', acclaimed the largest slum of Asia, the traffic congestion on the roads, the din and fury of Bhendi bazar, a shopping street in Central Bombay, the pedlars and the pavement dwellers, all merged in the ocean of humanity, present a sickening atmosphere.



The city, despite all its overcrowded and underprovided state, has a history of its own and offers enough incentives and attractions to people of all faiths and affiliations. The contrast in the economic status of its inhabitants and their life style do not generate a conflict but co-exist like the Indian caste-system, pigeon-holed in a spatial frame. Thus, one can distinguish a stratification of areas based on the status of their inhabitants. The upper class residentials like Nariman point, Back Bay reclamation area, Marine lines, Malabar hills, Napean sea road occupying the south and south-west part of the island, stand in sharp contrast to the 'chawls', the two-storeyed single room row houses of Girgaum, Parel and Lalbag, the latter under the shadow of the textile mills.

The most important area of Bombay city, both politically and commercially, is Fort, so called after the fort, built by the British during the early years of their occupation. This represents the earliest development of Bombay. Paradoxically, this old part is more spacious and better planned and has not suffered under congestion. This was literally the colonial Bombay away from the native town. Here, in the middle of the 17th century, the East India Company built a walled town occupying an area of 2 sq. km with three gates, the Bazargate to the north, Churchgate on the west and the Apollagate on the south. On the east, the town overlooked the sea. Inside the walled area was the flag staff, the Governor's house, the docks and marine yard, the church, the burial ground, the foundry and the smithy, the mint, the custom house, the hospital and finally the barracks, all making a miniature British colonial town, well secured and well provided. More and more institutions were added later and the wall was demolished as the British gained sovereignty over the land in the middle of the 19th century. A high court, a university, a railway terminus, a reserve bank, a club house, and a cricket club were added, and by the middle of the 19th century, the outlines of the present day 'Fort' were firmly established. Being close to the main railway terminus and the docks, the area for long remained occupied by public and institutional buildings. Interspersed with monumental buildings like Victoria Terminus, Bombay High Court, Bombay University with its clock tower, Municipal Corporation—all built in Gothic style, towering over the swaying coconut groves with spacious bowling green and oval, Bombay appeared an architectural transplant from the 'Continent'. The native town developed beyond the bazargate north of the Fort; the present Kalbadevi, Girgaum, and Bhendi Bazar, the three longitudinal sections, forming the residence of Gujarati, Marathi and Muslim population. Further north developed the industrial Bombay with more than sixty textile mills, with 'chawls' in the vicinity for their workers, beyond which another residential zone comprising Dadar, Matunga and Sion came to fill the island.

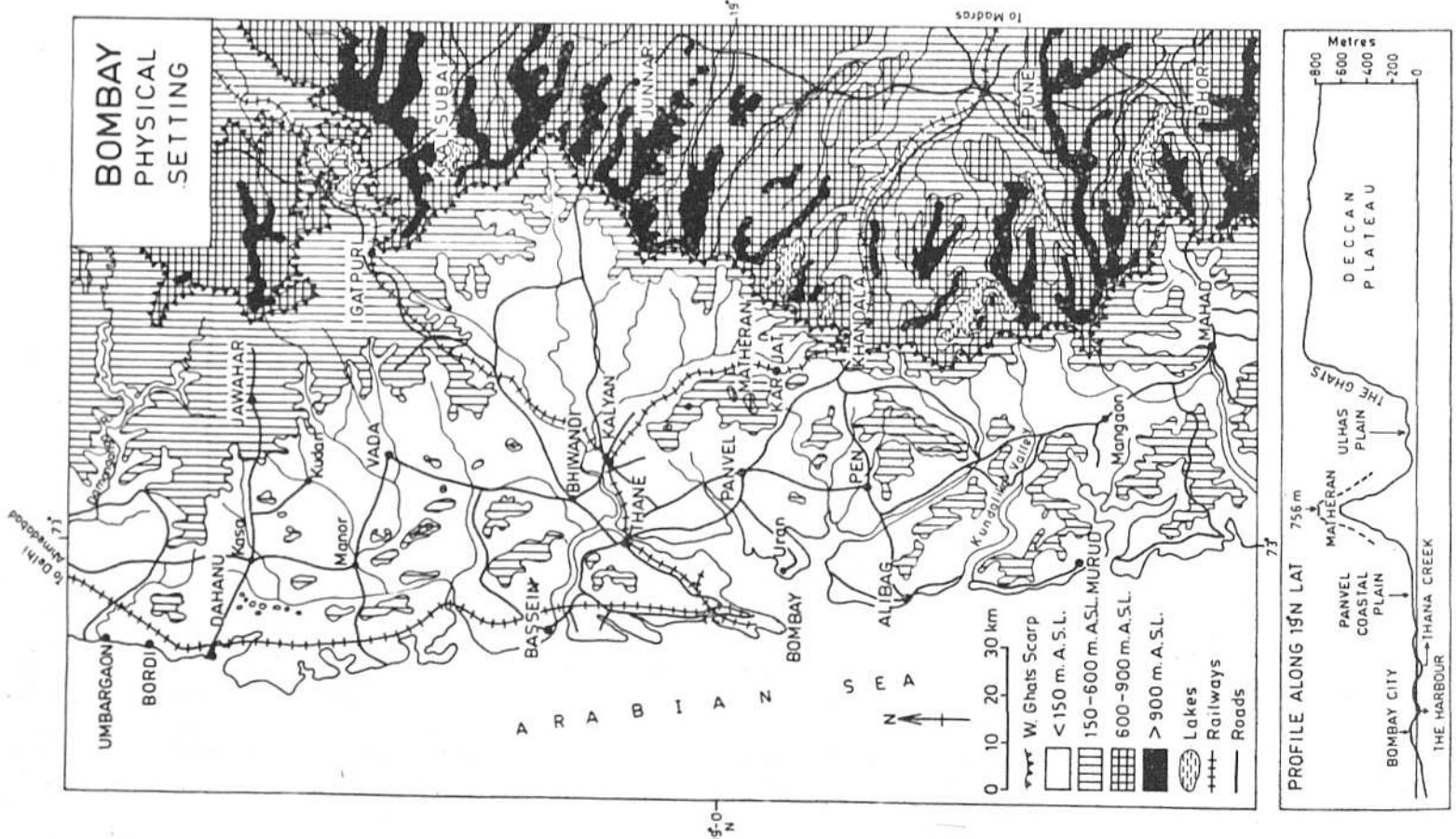
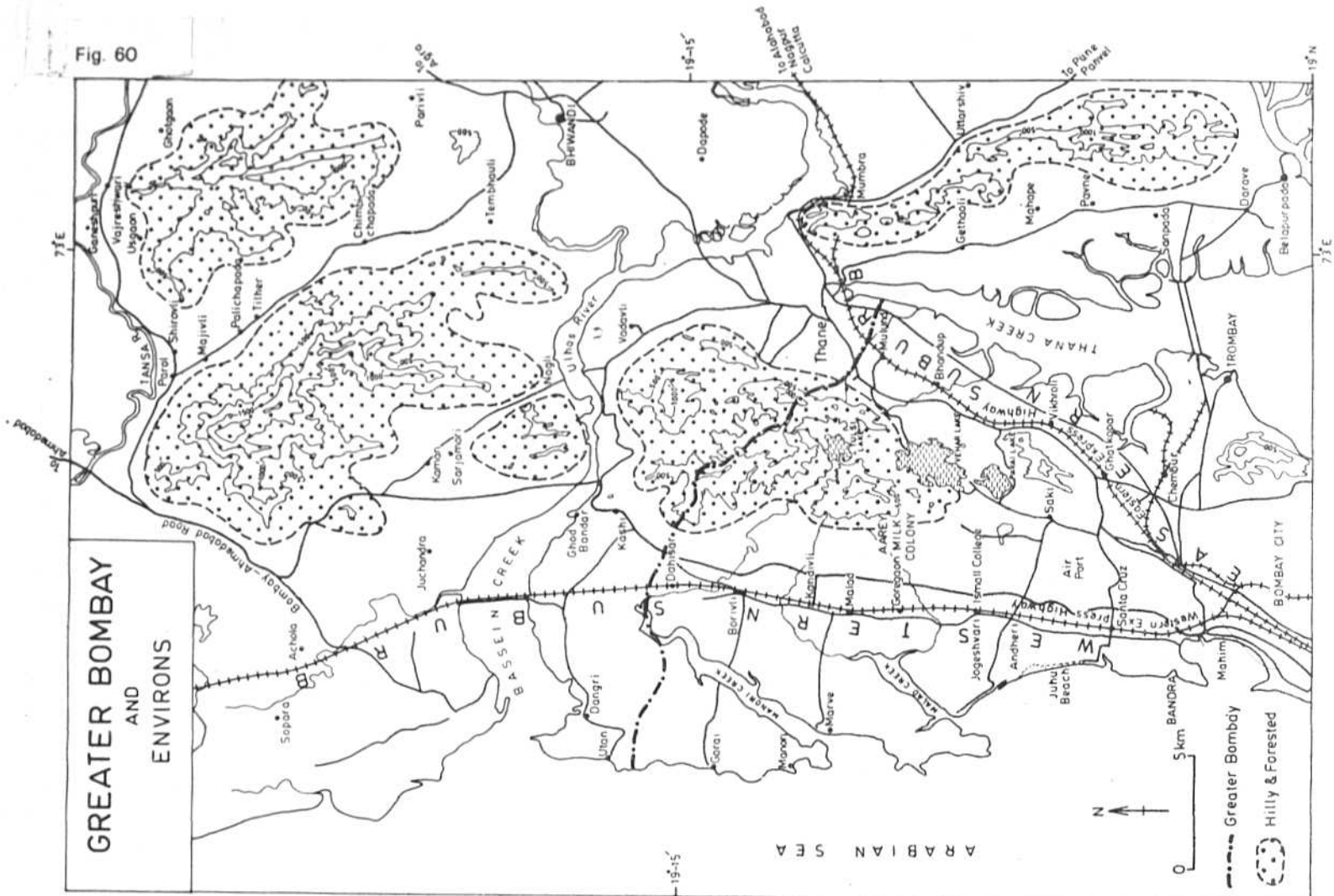
In the process of growth, many of the trading and retailing establishments preferred proximity to residential locales giving rise to shopping in the residential areas. The hilly areas like Malabar and Cumbala hills or the higher ground facing the western sea board, remained the preferred sites of the higher income group people. Thus, there developed a horizontal zonation from the south to north in which public and commercial functions in the 'Fort' were followed by a middle class residential, an industrial area with poor residential, and then again a middle class residential, along with a vertical zonation in which the hilly land and the western seaface were occupied by the affluent class, residential areas on either side of the industrial zone away from the creeks by the middle class, and the low land along the Mahim creek, the railway sidings and the industrial area, by poor residential.

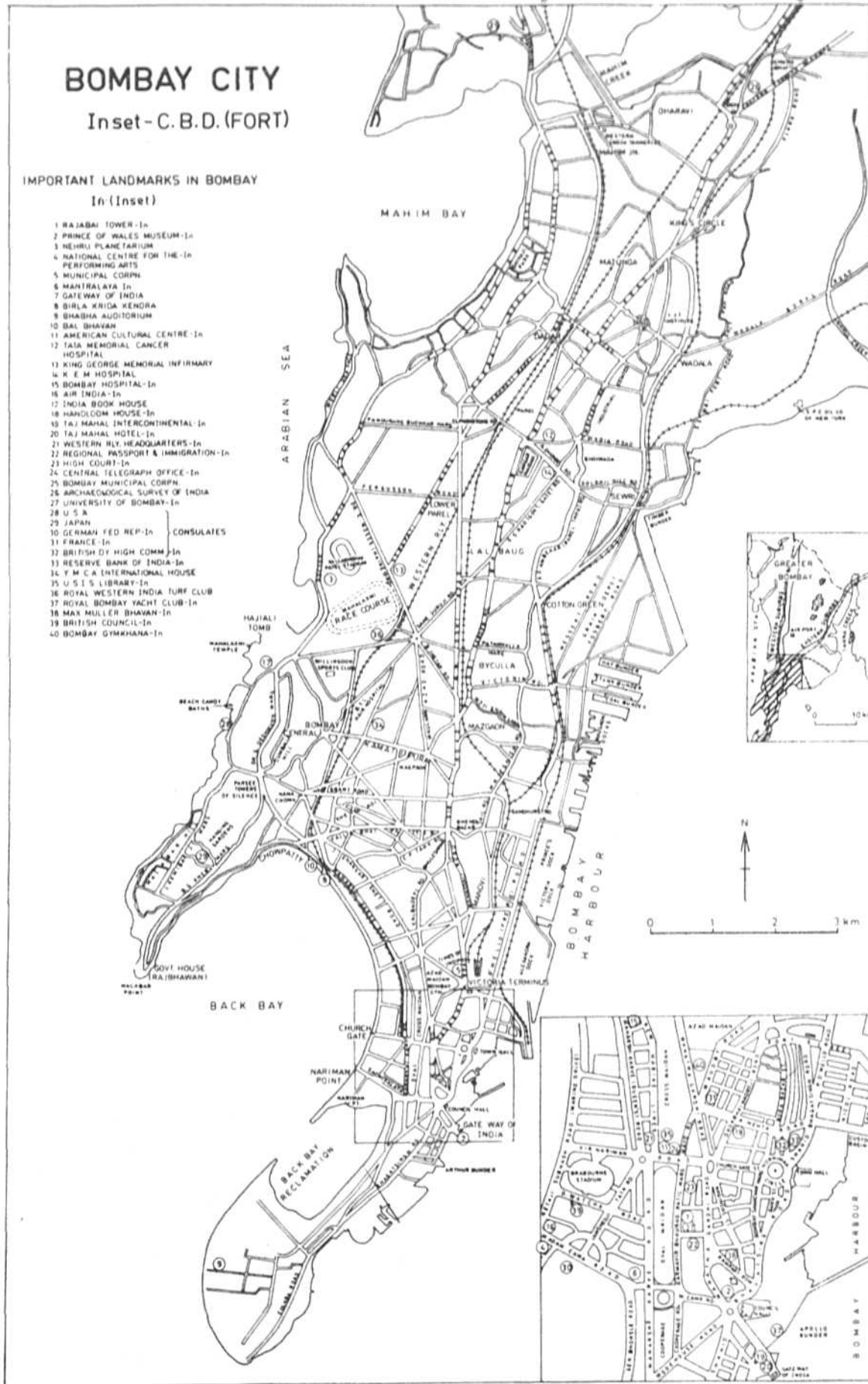
The Suburbs

The Suburban development of Bombay, beyond the Mahim creek, is aligned to the two railways, the western and the central, resulting into western and eastern suburbs. The Western suburbs having the advantage of level and well drained ground is inhabited by a higher middle class population, whereas the eastern suburbs bordering the Thane creek is either occupied by industries or is studded with slums. There is only an occasional occurrence of better residential areas.

The suburbs, no doubt, are better developed, designed as they were on the drawing boards of the Corporation. The distortions have been caused by excessive illegal occupation by junk yards, offensive and pollutant emitting industries, squatters colonies and slums which stretch for miles. Much before the Corporation authorities could offer a plan, part of the land is occupied by squatters colonies that spawn faster than the slow moving Government resolutions. The central part of the Salsette island, the island north of Bombay, and separated from the latter by Mahim creek, is occupied by hills with routes passing on either side following the sea board, the western railway and the Bombay-Ahmedabad road parallel to the open Arabian sea giving a north-south linear orientation to the western suburb and the Bombay-Calcutta and Bombay-Agra road, also called Ghodbundar road, parallel to the Thana creek and forming the axis of the eastern suburb. Thus, beyond the Bombay city (on Bombay island) the eastern and western suburbs, separated by a central hilly tract which also includes a national park, form parts of Greater Bombay. Between these two suburbs lie the two airports, the Santacruz airport, now used only for domestic aviation and Sahar airport for international flights.

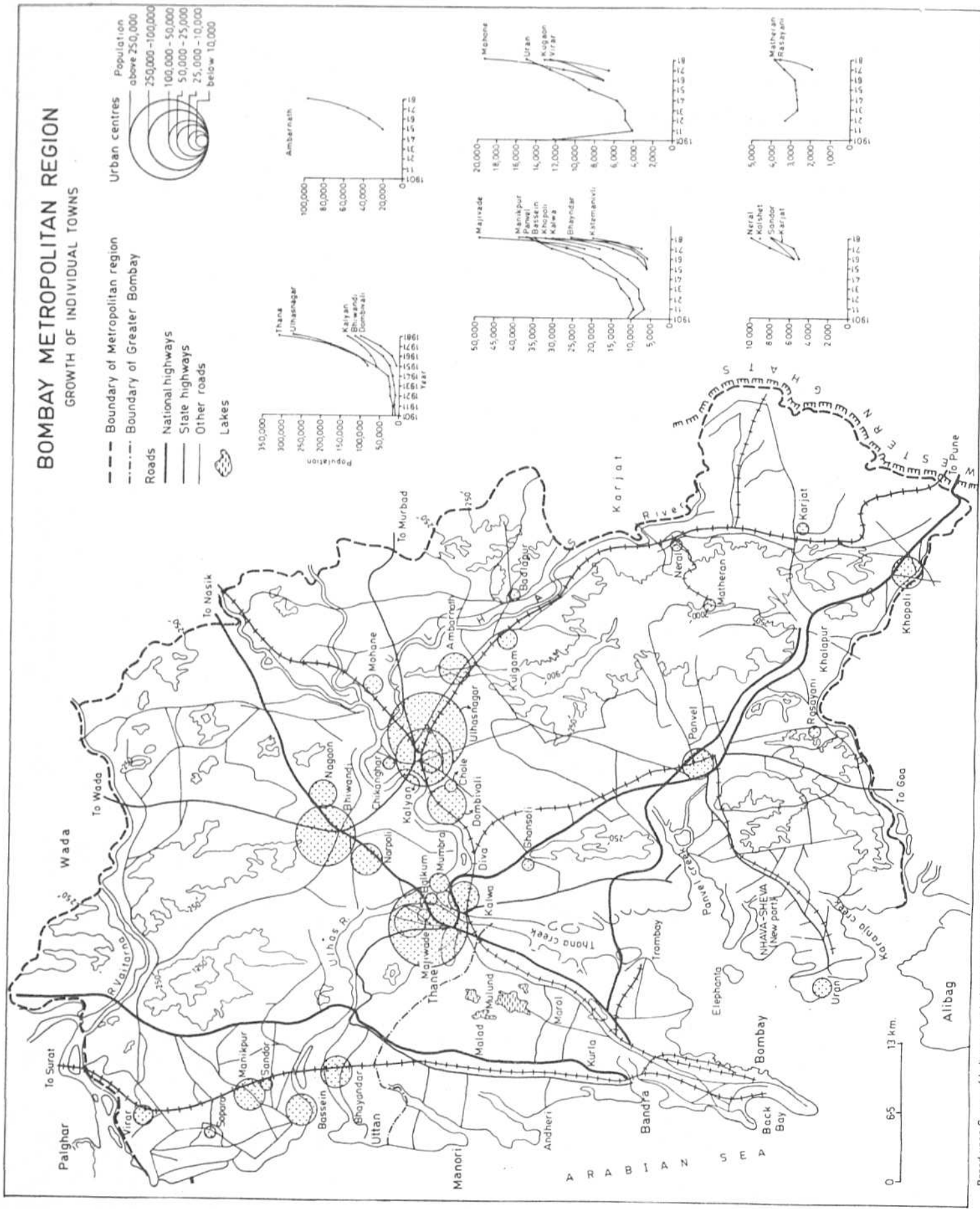
Fig. 60





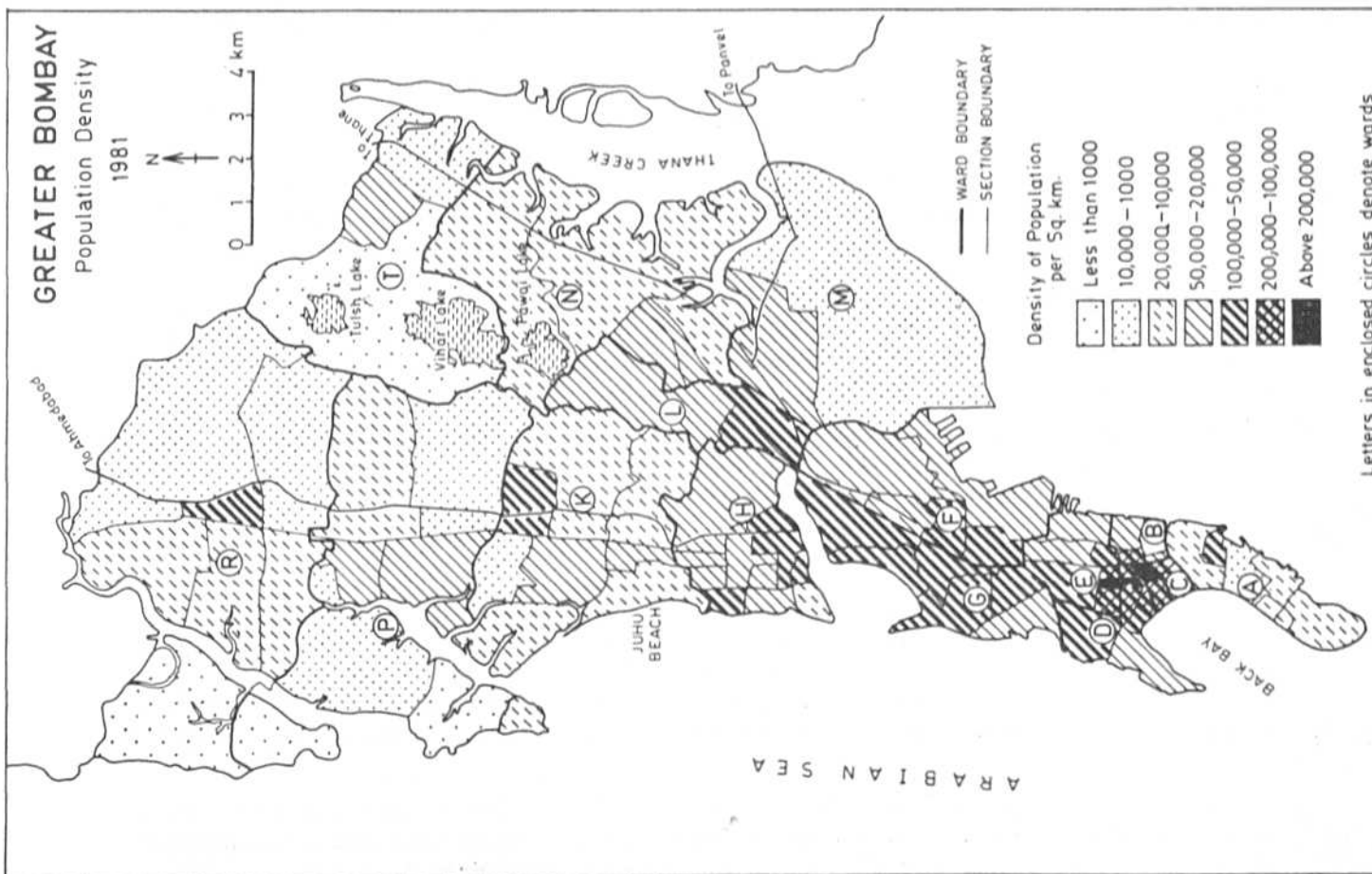
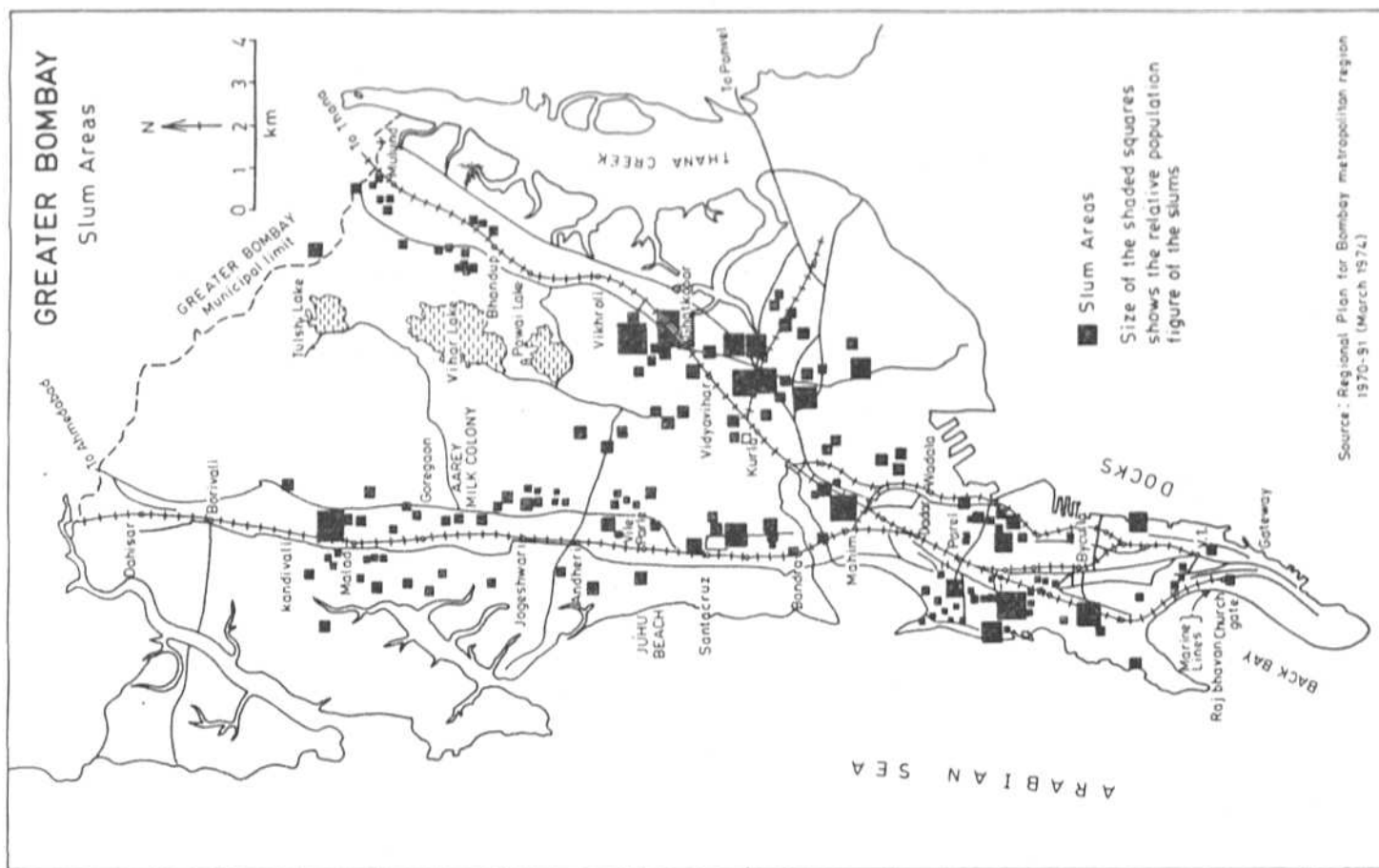
Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 62



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 63



While there is a string development of industries along the railroads in both the suburbs, a dominance of heavy industries, in the eastern suburb is obvious. The western suburbs have some of the fashionable housing areas and cannot be called a dormitory suburb.

Bombay—the premier city of India

Bombay, the largest city in the country, is symbolic of a society riddled with contrasts. This is not only a meeting ground of the west and the east, but also a place where the most affluent and the most deprived are equally at ease. The city, also a port on the Arabian sea board, was established by the Portuguese and developed by the British with the contemporary institutions and architectural styles. Besides spacious harbours and docks which have now become congested, an array of imposing buildings, the High Court, the University, the Victoria Terminus, the Municipal Corporation, to mention a few, with open grounds, were built to resemble a British town. Thus, came into existence the down town Bombay, the Fort, which still bristles with all economic and commercial activities, though with the crowding of buildings, it no longer retains the grandeur of the colonial days. The fort reminds one of India's colonial past.

Once a cluster of seven island with intervening creeks, bays and marshes, the town hardly carries any trace of its marshy physical conditions. Over the centuries, it is gradually reclaimed, built and completely transformed into a metropolis.

The Fort in the southern part of the island and the Kalbadevi and Girgaum road to the north conform well to the colonial arrangement of an Indian town with two contrasting faces, a Cantonment or a civil lines on the one hand, and the age-old core of the town, on the other. There is, however, one difference; while in most old cities, a civil lines or a cantonment is a recent accretion, a contribution of the British to the morphology of the town, in Bombay, the colonial and the native town appeared simultaneously.

Though Bombay is the capital of the state of Maharashtra, it is often looked upon as the economic capital of the country, with its port, handling a major part of the international trade of the country, the Central office of the Reserve Bank of India, the largest stock exchange of the country, the principal centre of textile products and trade, some major oil refineries, a centre of automobile industry and the termini of the Central and Western railways. Being an important centre of education, it has some of the best research institutions of the country. From Bombay, the railway lines radiate to Delhi, Calcutta and Madras.

The city is still a preferred site of many institutions, though excessive congestion, exorbitant cost of land and incentives given by the State for establishing industries in underdeveloped areas have led to the stoppage of this land and quite a few industries have moved out of Bombay city, and a large number up on the plateau in the vicinity of Pune, Nashik and Kolhapur. A number of industrial complexes have appeared in the vicinity of Bombay. The National Fertilizer Complex, the thermal power complex at Trombay and the Belapur-Panvel industrial region are late additions to the growing industrial spread of the city. The home of 'Tatas', a major industrial group in India, the city's population is not only full of immigrants from various parts of the country but is also a museum of ethnic diversities from the Parsis to Bengalis and the Kashmiris to Tamilians.

Inside the town, some of the areas are very densely peopled and slum conditions prevail in certain quarters of the central part of Bombay. The two railway lines running north-south, almost the entire length of the island, carry millions of passengers every day.

Industrial Landscape

Bombay has a century old history of industrial development. The earliest to start in the city were the textile mills which at present dot the city. At the time of their establishment, these occupied a peripheral location, but with the growth of the city, these have come to occupy a central position. Many moves to shift these industries outside the city have failed, and their presence in the thick of the town is symbolic of the static nature of the entire economic system. There are 250 textile manufacturing units in the city, of which about hundred are large scale spinning and weaving mills giving Bombay the status of a textile town.

During the last forty years things have changed considerably. The importance of textile mills has declined and their place is taken by engineering and chemical industries, the former occupying a belt in the eastern suburb parallel to the Central railway and the latter spread all over the suburbs. The

engineering goods have a wide range, starting from automobiles to simple machines and electric motors. The chemical industry includes basic chemicals, pharmaceuticals, dyestuffs and paints. The setting up of petroleum refineries in Trombay, close to Bombay, induced the growth of an entire chain of petrochemical industries, and the discovery and exploitation of petroleum from the sea, close to Bombay, have brought in their wake a large number of industries utilizing the natural gas and other by-products of the refineries. Another group of industries, of which Bombay is the centre, is plastics.

The industries in the city, and even outside, are so intermingled with the residential area that it is difficult to delineate an exclusive industrial zone in the town. Outside the city, in the metropolitan region there are a few industrial centres, with some more on the way to acquire an agglomeration of industries. Two important industrial centres in the metropolitan region are Kalyan and Ambarnath. The former has a large railway workshop, with textiles, paints, cables, rayon and heavy chemicals as the main industries. Ambarnath, further away on the Central railway, is the site of an ammunition factory besides heavy chemicals and fertilizers, safety matches and other engineering goods.

The emerging industrial belt.—Three areas which have, of late, emerged important in the industrial profile of the metropolitan region are (1) Thane-Belapur belt (2) Panvel-Trans-Thane belt (3) Uran-Nhava-Sheva belt. All these areas are getting filled up. The Thane-Belapur has attracted many industries, located as this belt is between Thane in the north and the township of New Bombay that has been developed on its southern extremity. The Panvel belt has attracted pharmaceuticals and breweries, and Uran is potentially the most important industrial area of Bombay. Already, it has a brewery and a few industrial plants. A number of industrial and power generating units are on their way to completion, and before long, the area will be humming with industries. The industrial units being set up in Uran-Nhava-Sheva area depend, either for their raw material or power, on the Bombay High gas. Three fertilizer plants, one at Thal-Waishet, another at Trombay and a third in the same area, one liquified petroleum gas plant, a power project at Uran with an installed capacity 270 MW, using gas and another thermal power unit (500 MW) using coal, are already underway. The establishment of a new port across the Thane creek at Nhava-Sheva will provide an added advantage to this industrial area besides relieving congestion in Bombay.

The spatial organization of industries in Bombay Metropolitan region could be summed up by recounting the textile mills, the oldest industrial units in the city proper, the engineering industry, the automobiles, paints, pharmaceuticals, plastics and electronics industries developed during the last forty years, in the eastern and western suburbs, tethered to the railway line, the oil refineries and fertilizer plants at Trombay, and finally the industrial complexes that have grown at Kalyan, Ambarnath, Panvel and in Thane-Belapur belt. To this, one may add the engineering industrial landscape of Uran, with power generation, fertilizer and chemical plants supported by the port at Nhava-Sheva under construction. Khopoli, at the foot of the Western Ghats, with chemicals and paper and pulp industries, and a hydroelectric power generating plant, and Bhiwandi with small-scale industries, particularly power-looms, are other industrial areas.

Out of the total area of 43,332 hectares of Greater Bombay, 5,678 hectares (13.5%) is delineated as industrial zone. In the Metropolitan region, outside Greater Bombay, the industries are distributed as follows:—

T-18.1 *Industrial Areas and Industrial Units in Bombay Metropolitan Region outside Greater Bombay*

Location	Developed industrial area (hectares)	Industrial units in production	Employment
(1) Thane	324.48	511	21,223
(2) Trans-Thane creek	2069.37	170	21,442
(3) Kalwa	49.32	31	21,442
(4) Mira	782	10	106
(5) Dombivali	363.40	337	8,977
(6) Ambarnath	229.45	181	6,064
(7) Badlapur	104.41	109	1,540
(8) Kalyan-Bhiwandi Road	48.61	19	1,203
(9) Taloja	876.93	71	3,123

Source.—Draft five-year plan (1978-83), Maharashtra, page 314.

The development of industrial areas, outside Greater Bombay, in the Metropolitan region, though apparently aimed at the dispersal of industries, has not achieved this objective, since these industries have occupied large acreage of good land which would have, otherwise, been available for residences.

T-18.2 *Population growth of Greater Bombay and other towns in the Bombay Metropolitan area*

Towns	1901	1911	1921	1931
Greater Bombay ..	812,912	1,018,388	1,244,934	1,268,306
Thane ..	16,011	15,591	22,639	21,816
Ulhasnagar ..	....	....	....	....
Kalyan ..	10,749	12,600	17,829	26,291
Bhiwandi ..	10,354	13,292	12,188	15,619
Ambarnath ..	....	....	....	....
Bassein ..	10,702	9,598	10,366	12,689
Dombivali ..	....	....	....	....
Panvel ..	10,152	6,757	7,837	8,366
Uran ..	12,237	4,161	4,802	4,981
Virar ..	....	....	....	....
Bhayandar ..	....	....	....	....

Towns	1941	1951	1961	1971	1981
Greater Bombay ..	1,686,127	2,966,902	4,152,058	5,970,575	8,202,759
Thane ..	29,751	61,767	1,101,107	1,70,675	309,271
Ulhasnagar ..	....	80,861	107,760	168,462	273,332
Kalyan ..	31,350	58,900	73,482	99,547	135,870
Bhiwandi ..	18,776	25,764	47,630	79,576	115,256
Ambarnath ..	....	21,498	34,509	56,276	78,996
Bassein ..	13,969	19,640	22,598	30,594	52,341
Dombivali ..	....	8,106	18,407	51,108	103,213
Panvel ..	10,960	14,861	18,130	26,602	37,026
Uran ..	5,794	8,672	10,229	12,616	15,168
Virar ..	....	7,233	9,413	12,713	23,179
Bhayandar ..	....	6,327	6,974	10,598	25,611

Town directory, Census of India, Maharashtra (1971). Census of India (1981)—Maharashtra, Part II-B.

A look at the regional plan for Bombay Metropolitan region convinces one that in their pre-occupation to find space for industries, the planners have neglected the residential requirement of the urban population. The Trans-Thane area east of the Thana creek marked as 'Twin City' is yet to be properly planned, but here again, the choicest land may go to the industries.

Demographic characteristics of towns in the Bombay Metropolitan region

The most important town of the region, Bombay, has exhibited a very rapid growth over the decades, followed by a number of urban centres in the peripheral region of Greater Bombay. The vigour with which Bombay grew is unparalleled and is a measure of the unsurmountable problems that the city is facing today. Most towns, both inside and outside Bombay agglomeration, have grown at a tremendous pace. Greater Bombay grew 2½ times between 1941 and 1961, and during the last twenty years, it has again doubled. Like Greater Bombay, most towns in the Metropolitan area, particularly those on the main transport arteries, have doubled during the last two decades, but there are some which have registered an abnormally high growth rate. Thane, a district place and contiguous to Greater Bombay, increased three-fold, but the most striking case is that of Dombivali, close to Kalyan, which increased six-fold between 1961 and 1981. A very characteristic feature of the population in the Bombay Metropolitan region is a high ratio of working population in most towns. Greater Bombay has

two-thirds of its population in the age group 14-59, and a similar high ratio is observed in other towns where this varies between 50 and 60 per cent. The high proportion of working population which largely consists of males has an adverse influence on the sex ratio giving enormous bias in favour of males. In Greater Bombay, the sex ratio is represented by 716 females for every thousand males, resulting from single migrants to the city. Besides the motivation to save money, acute shortage of accommodation has discouraged family migration to this metropolis.

The sex ratio tends to be normal as one moves away from Greater Bombay. Thus, Thane, Kalyan, Ambarnath and Dombivali, each of these towns has a normal sex ratio as opposed to Greater Bombay which is worst affected by single migrants in the rural-urban stream.

The problems of Greater Bombay and the Metropolitan region

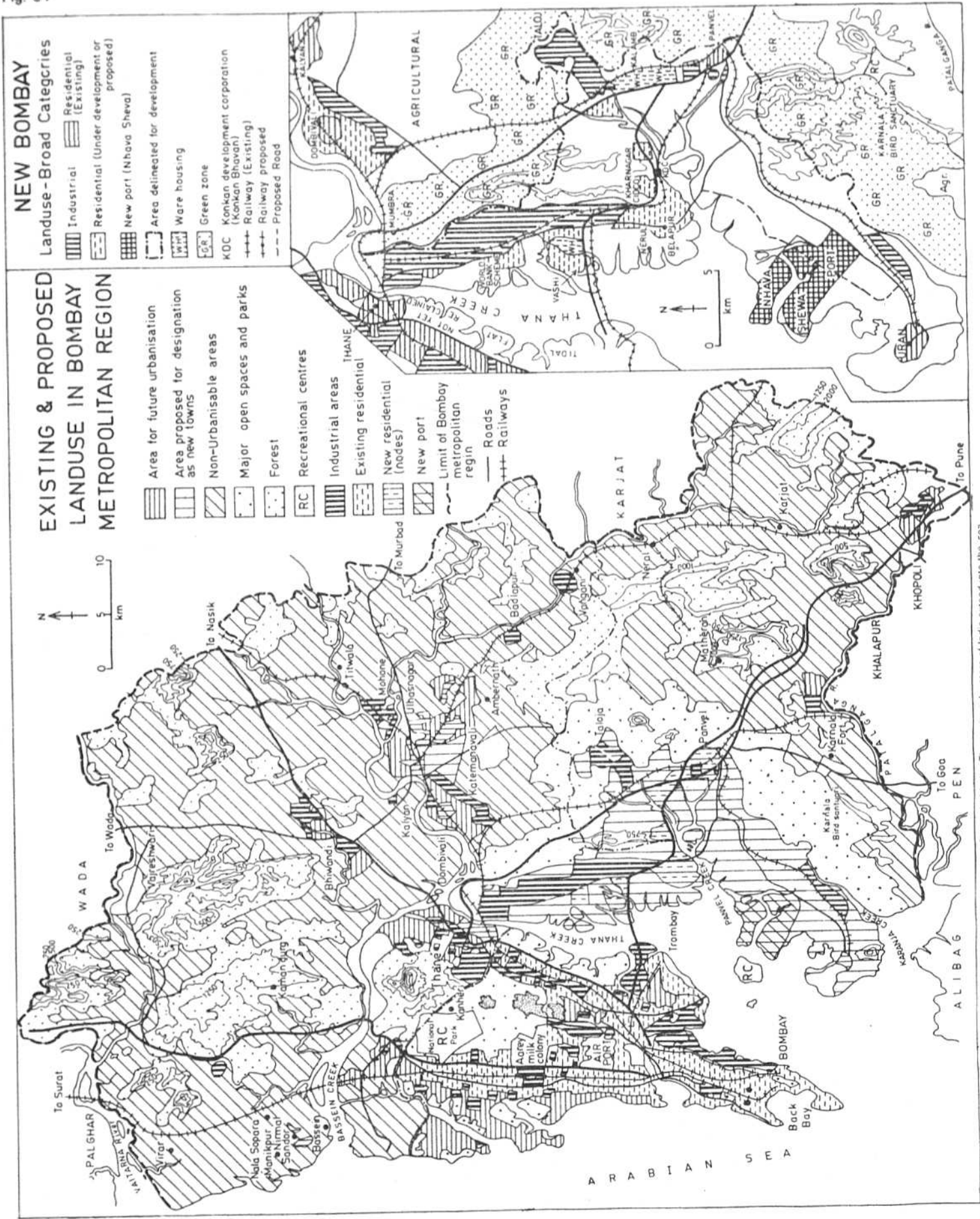
The most apparent and the most dehumanizing problem emanates from very high density of population, urban congestion a pathetic dearth of housing and the concurrent development of degrading slums. Most of these problems are inseparable from each other. While a high density of population in the old commercial core of the town leads to sub-standard housing conditions and strained civic amenities, the most alarming feature is the large number of houseless population living on pavements, beaches, railway stations or joining unauthorised squatters colonies (*jhopadpattis*). The elongated disposition of the island surrounded by sea has led to the spread of the city only to the north, filling every inch of space in the city, the open areas confined to the northern extremities, from where the people reach their place of work only after hours of commuting. Thus, the part of population that could afford a high rent accommodation has clustered on the island, not infrequently individual rooms shared by a number of bachelors. This is the case with mill hands and manual workers. The white collar population has spilled onto the suburbs and has managed to survive even after paying back-breaking rent. There is, however, a large segment of the urban population which consists of people earning low salaries and modest daily wages. This category also includes the recent migrants doing odd jobs, like vending or working as porters and can hardly afford to pay any rent, nor can they leave the city for fear of losing whatever source of livelihood they have. Such people have squatted wherever they could find a place, even in the face of stiff laws and encroachment act. Once a nucleus develops, it grows overnight by accretion and soon enough turns into a formidable pile of tin-sheets and tarpaulin, like a mass of rubble which defies all norms of architecture, posing a challenge to the value system of the Indian society that boasts of democracy and equality. In due course, these colonies become permanent as they get the protection of political parties, and the inhabitants become established urban dwellers, getting their supply of food grains against valid documents, and become part of the city. According to one estimate, about 40 per cent of the population of Bombay lives either in dilapidated houses, slums or these shanty towns.

Density pattern.—The overall population density of Greater Bombay is over 19,000 persons per sq. km. This is however misleading and not uniformly distributed. On the island of Bombay, the old town, north of the Fort, shows an alarmingly high density of population. There are many parts where the density is more than 100,000 per sq. km. and no part is so congested as Ward 'C' consisting of areas like Bhuleshwar which has a density of over 90,000 persons to the sq. km. As one moves northward, the congestion ameliorates, though the number of squatters colonies increases. In the northern part of the city, the density is 25 to 50,000 persons per sq. km. The same density pattern though on the decline, continues in Bandra, Khar and Santacruz, the near suburbs of the city but further north, the density declines to 10-15,000 per sq. km. It is not that the suburbs immediately to the north of the city are less crowded, but a relatively low density of 25-40,000 reflects the spread of non-residential land like Bandra goods yard, Juhu airstrip, Santacruz airport, Bombay University at Kalina, and many hill sites which are either less developed or occupied by high income group people avoiding congestion.

The city and the region

The enormous size and the concentration of economic activities have enabled the city to bring under its influence not only the state of Maharashtra of which it is the capital, but the entire country. With its immense economic strength, diverse attractions and employment opportunity, it has attracted people from all parts of the country who have contributed to the growth of the city and participated in its development. This can be seen from the fact that over two-thirds of the population is migrant, born outside the city. Of this, Maharashtra has, as indeed it should, contributed more than 40 per cent, followed by Gujarat and Uttar Pradesh, the states contributing 17 per cent and 12 per cent of the migrant population respectively. Kerala, Tamilnadu, Andhra Pradesh and Karnatak together send as

Fig. 64



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright: 1985

many immigrants to Bombay as Gujarat. Among the districts of Maharashtra, Ratnagiri contributes about 45 per cent of the total Maharashtra immigrant population, followed by Satara, Pune and Thane. A conflict of interests, particularly for jobs, has occasionally generated some degree of acrimony, but Bombay, a melting pot of humanity, has been able to absorb these occasional shocks, and resume a harmonious social life. If there is some place where regionalism is least visible, it is Bombay. No one feels a stranger and the most feel welcome to the place. It is more cosmopolitan than any other Indian city, and in more than one sense, truly represents the Indian scene.

Having a large agglomeration of industries, the Bombay Metropolitan Region gets raw materials and manpower from all parts of the country and in turn supplies the manufactured commodities which find a place in the remotest village markets of India. Being the leading port town, more than half the country depends on Bombay for export. For the State of Maharashtra, Bombay is the nerve centre controlling and directing the economy of the State. Being the state capital, the policy and programmes of the Government finalized at Bombay find their implementation in the remotest parts of the state. In fact, localism has ceased to function in Maharashtra because of the total dependence on, and overwhelming command, the city exercises.

The public utility services, though always strained because of the influx of additional population are one of the best organized in the city. Local trains and a fleet of buses run by Municipal Corporation, all along the length and breadth of Greater Bombay, carry millions of commuters every day. Water for the city is brought from hundreds of kilometers in the Western Ghats. What is alarming is that in promoting the economic and industrial activities of the town, the human consequences have been ignored. Unskilled manpower, since the country abounds in it, is the most neglected component in the growth of the city. The city needs and employs the unskilled labour without providing them shelter. The result is, that caught between rural unemployment and poverty and the urban filth, the poor opt for the latter, assured as they are of their physical survival on meagre wages carrying habitually a sub-human existence.

A city of over eight millions, the gateway of India, Bombay is India's largest sea and airport. With its banking and financial institutions, the Reserve Bank of India, and the largest exchange, it has a good hold on the economy of the country. Though known for its economic prosperity, the city is also a leading centre of science and culture with a number of premier scientific institutions located here. Living in the shadow of its wealth and affluence are the millions of poor who live a sub-human existence perpetually reminding one of India's poverty.

A paradoxical aspect of the regional relations of the city, is an extremely poor immediate hinterland of jungle-clad hills and tribal population. The growth of the city and all its economic activities do not seem to have made a dent in the poverty of this region. The peripheral area contiguous to Bombay has, no doubt, experienced a phenomenal change by way of rise in land values, transport network, location of industries and even serving as dormitory suburbs. But the purely agricultural land away from the transport thoroughfares and the hilly land with jungle and rugged terrain have not been touched at all. The development of any part of a city region is incidental to the growth of the city. All such goods and services as the city does not produce itself, like raw materials and labour for industries, water and energy for its multifaceted economic activities, food for its citizens and other requirements for the efficient functioning of the city, are brought from the hinterland. In the process, some ancillary industries may develop elsewhere, some workshops may start functioning, some people from outside the city may get employment, but these are not because the city plans for the development of its hinterland and are more or less incidental and oriented to the demand in the city. These marginal benefits accrue to the region not because this forms part of the city's growth plan, but as a fall out of a highly centralized development. The tribals of Sahyadris and the entire hilly region groans under the shadow of Bombay's opulence with no amelioration of its poverty.

The regional relations of Bombay or for that matter of any city are balanced very much in favour of the large cities. Bombay may be a product of a region, but a reciprocal function to promote the growth of the region is not a part of its function.

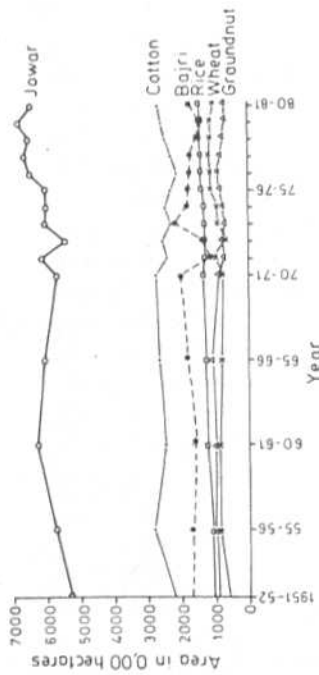
Fig. 65

MAHARASHTRA Land utilization 1978-79

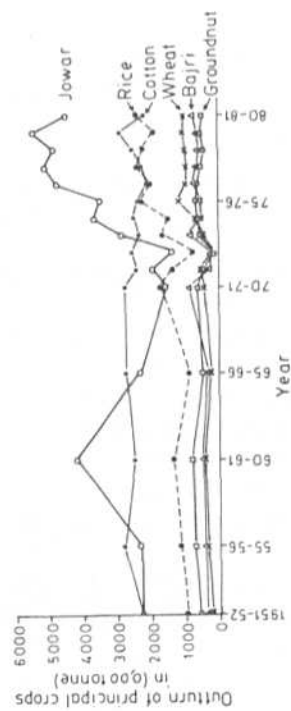
Total Geographical area 3,07,58,000 hectares



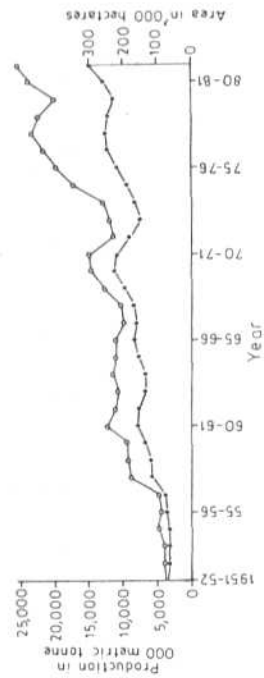
Area under principal crops



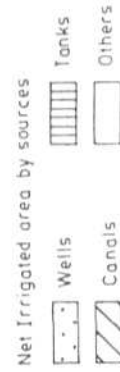
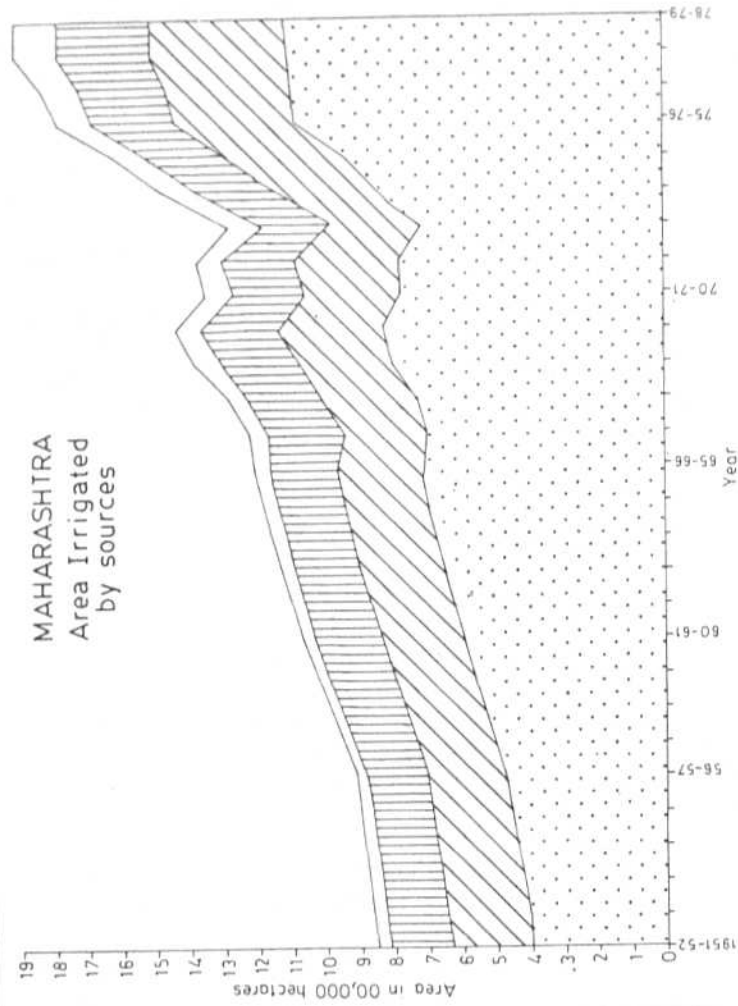
Production of principal crops



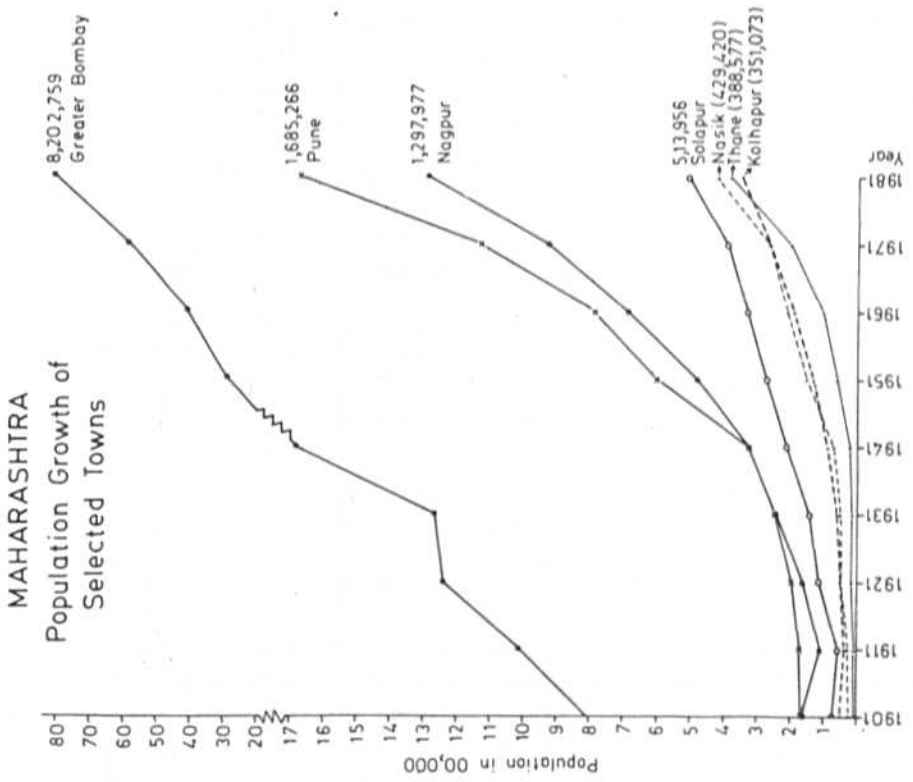
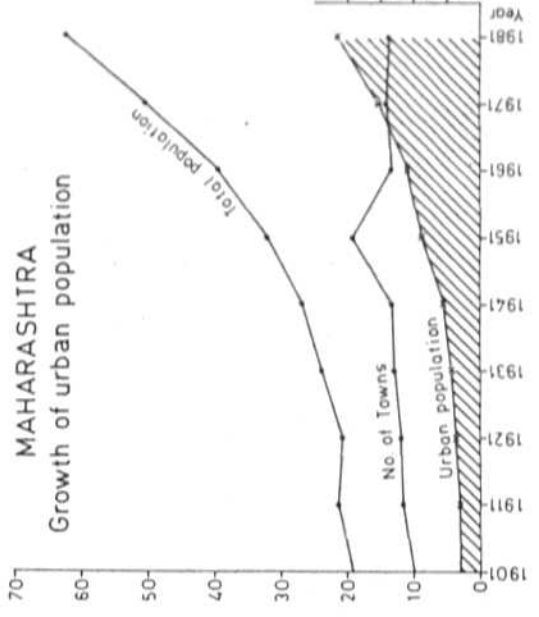
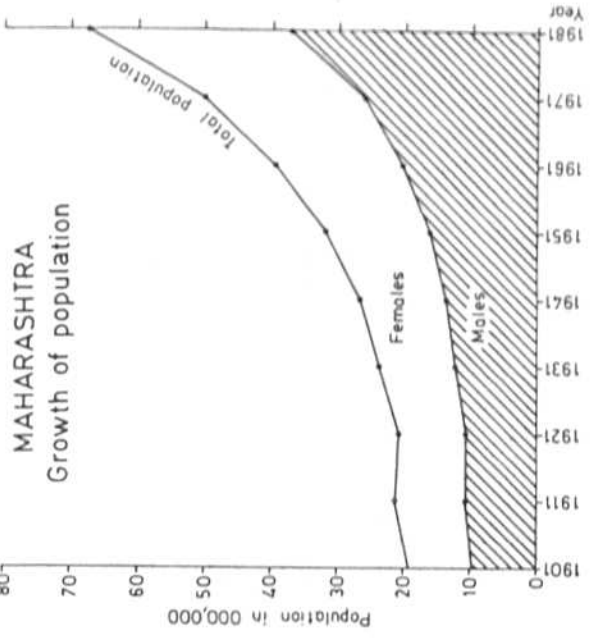
Sugarcane production & acreage in Maharashtra



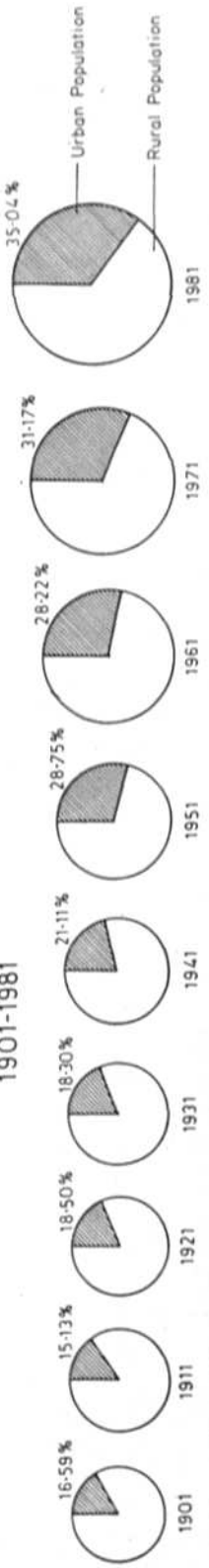
MAHARASHTRA Area Irrigated by sources



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985

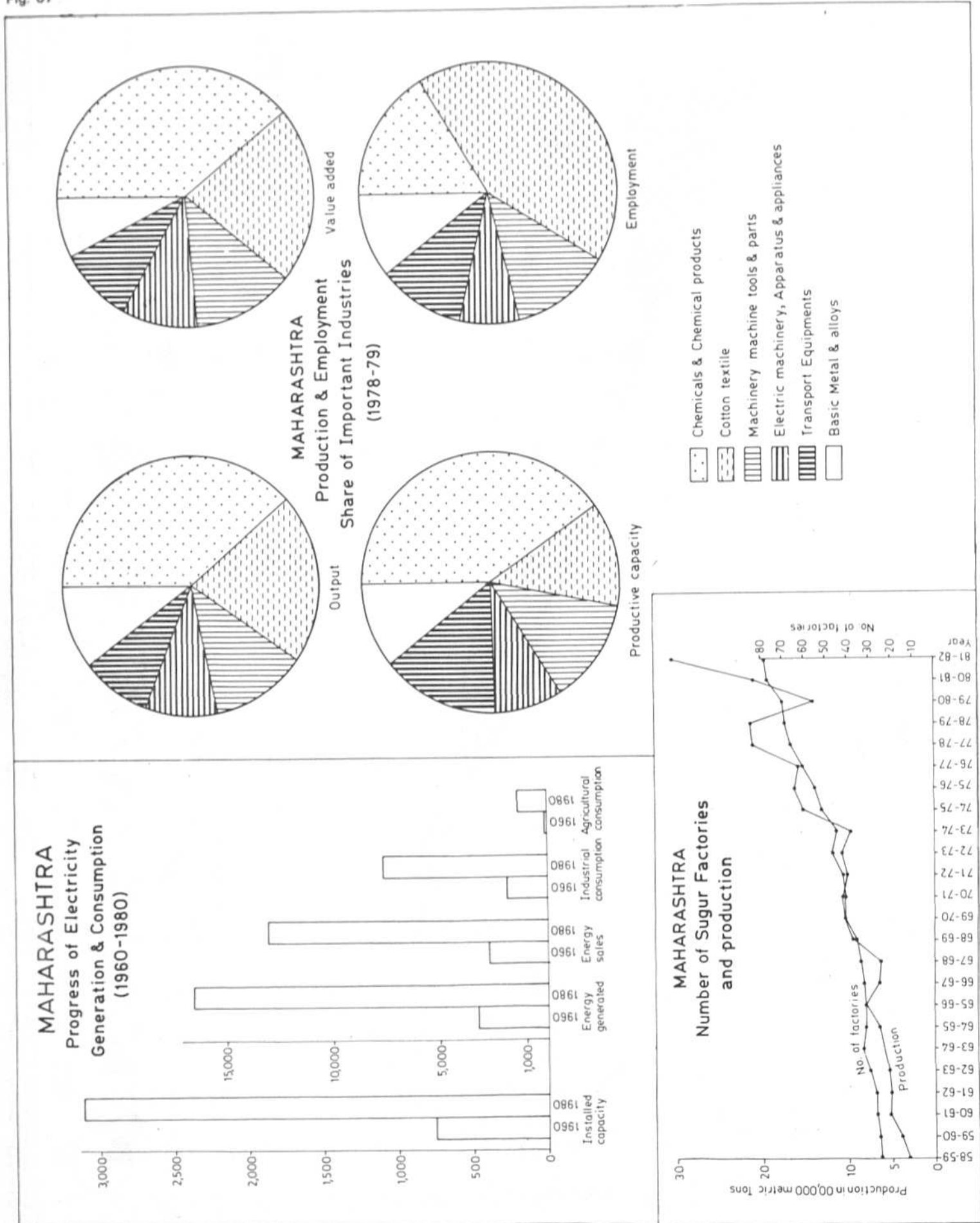


MAHARASHTRA Percentage of urban population 1901-1981



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985.

Fig. 67



Based upon Survey of India map, with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line. Government of India copyright 1985

CHAPTER XIX

MAHARASHTRA—RETROSPECTS AND PROSPECTS

The foregoing pages were intended to give the readers a glimpse into the land, the people and the economy of Maharashtra. The account is brief and factual, and no attempt is made either to provide a comparable picture or to assess the situation in human and economic terms. The logic of comparison is, nonetheless, inescapable, and one is ever struck by the contrasts and the disparities as they emerge regionally, or on the backdrop of the national scene.

Apart from the level of economic development which manifests itself in the economic landscape and production indices, there are several other factors and processes which together promote a regional personality or culture. The adaptation to the natural environment and historical traditions forms the basis of what one may term regional identity. Religion and language are yet other attributes which have a binding effect and induce group identity. Language, as an element in group cohesion, has received constitutional sanction in India and forms the basis of the organization of the states. Maharashtra, as much as several other states, is a linguistic region. This is not to say that all parts of the State have an identical culture; on the contrary, there are distinct sub-cultures based on their history, economy, resource-utilization, terrain conditions and climate, and separated from other areas in the same linguistic region by long distances. Thus, subordinate to, and subsumed in, the larger national identity, are a multitude of regional and sub-regional cultures, usually, but not invariably, coinciding with the states or their parts. An account of such a region as Maharashtra develops a focus and comes into relief only when projected against a larger national background, or seen in juxtaposition with other states or regions.

Locational and physiographic characteristics

Maharashtra, by its very location, has certain advantages, but is, at the same time, handicapped because of its locational attributes in some other respects. It is one of the eight major littoral states of the country, with a coastline of 720 km, and exploiting to its advantage the fishery resources of the shallow waters of the Arabian sea continental-shelf. While its coastal location has opened for it the vista of international trade, as is evidenced in the growth of the important port of Bombay, the long east-west axis of the State has introduced an element of remoteness, particularly as the location of the capital city of Bombay does not command a geographical centrality. This remoteness from Bombay, the nerve-centre of the State, is reflected in a slow pace of the growth of infrastructural facilities, a retarded movement of innovations, and an overall backwardness, resulting either from historical antecedents or a contemporary neglect. In any case, distance is the prime determinant and emphasizes the importance of median location of a capital city.

The alternate arrangement of plateaus and valleys, with a northwest-southeast disposition, has come in the way of developing an effective network of transport. The Satpudas, Ajanta, Balaghat and Harishchandra ranges—in fact, more plateaus than ranges, having earned the title of range by virtue of their linear alignment—carry a thin mantle of infertile soil, devoid of nutrients and without any prospect of irrigation, located as they are hundreds of metres above the river plains. As a result, agriculture and important agricultural settlements are largely confined to the fertile land in the valleys.

The most important physiographic landmark in Maharashtra is the Sahyadrian range, a veritable backbone, which running parallel to the Arabian sea board has divided Maharashtra into two distinct units, the Konkan coastal lowland and the Maharashtra plateau. The Sahyadri occupies a pivotal place in the history, legend and culture of Maharashtra and is the source of most of the rivers in the State, thus holding its lifeline. While causing rainfall in the Konkan and the western rim of the Deccan plateau by forming an effective barrier in the path of the south-west monsoons, it creates a rain-shadow area east of the range and deprives Central Maharashtra of its legitimate share of summer rains. Notwithstanding its negative role for much of Maharashtra, it is difficult to overlook the role and significance of the Sahyadris in the life of the state. The grandeur of its natural landscape, the scenic beauty of its peaks, forests and forts, and finally its water, mineral and biotic resources are so overwhelmingly important that its negative role recedes into the background.

In many respects, Maharashtra is a land of extremes, and the contrasts in its surface relief have not only produced an uneven topography, far from the monotony of a plain, but also influenced the life style of the people varying, in response to the natural conditions, from one region to the other. The coastal lowland and the Sahyadrian heights, the high rainfall belt of Western Maharashtra and the dry core of the State, the rich black cotton soil of Godavari valley and the infertile lateritic terrain of Konkan, the industrially developed Bombay-Pune region and the tribal belt of Chandrapur, and finally the hi-tech world of scientists, industrialists and the affluent in the metropolitan city of Bombay and the unobtrusive life of a peasant in Marathwada—all this within a journeying distance of a few hours—have nothing in common.

Transition from the Past

For generations, the people in the State depended on the limited resources available to them, some fishing in coastal waters, others practising rainfed cultivation and still others living in the fastness of the jungles. The picture was that of desolation and poverty. Droughts, epidemics and a general poverty condition took their own toll. The 'ryots' thankfully paid the rent of the land and pleaded for subsidy and remission of rent in the years of crop failure. The rural-urban migration was not a common feature a hundred years ago, since the conditions in the towns were no better. Inter-regional movement of goods and people was restricted and not a few perished out of starvation during famines. The pre-British administration of the Moghuls and the Marathas was geared more to administrative control and revenue collection, and hardly, if ever, was sensitive to the economic well being of the people. The British brought a semblance of order and did think in terms of river water utilization, better farming system, cheaper and more efficient transport and a general industrial development. One thing that proved a blessing in disguise during the historic times was a low population growth rate as a result of high mortality. Never did the country experience the pressure of population that is being felt today.

While things have greatly changed and there are no more large scale deaths due to epidemics or famines, the vagaries of nature have not been tamed and the State continues to suffer from uncertain rains and frequent droughts, adverse conditions of relief and a soil that remains sterile in the absence of adequate rain.

Rainfall distribution, water-problem, agriculture and irrigation

More telling in its affect than the relief and soil, is the distribution of rainfall in the State, a distribution characterized by a relatively heavy rainfall in Konkan and the Western Ghats, a moderately high rainfall in the eastern part, and a relatively dry central region. About half the area of the State receives less than 700 mm of rain annually, with periodic droughts as a result of the failure of monsoons, delayed rains or long dry spells. A well spaced distribution of rainfall, in time, is as important as the amount. A late monsoon-burst, a long dry spell in the rainiest of months or a failure of receding monsoon rains in late September or early October could spell disaster. Agriculture in the State depends heavily on the bounty of nature and suffers from the constant danger of drought, crop failure and scarcity conditions. The balance is so precarious that a delayed onset affects *kharif* crops, a failure of the terminal monsoons *rabi* crop and a long dry spell in the middle of the rainy season scuttles the prospects of both.

Inadequate rains in many parts of the State have condemned the people of these areas to perpetual poverty and frustration. Technology of transfer of water, from the high rainfall areas to the areas receiving very limited rainfall, is one thing that has been attempted by building dams and developing reservoirs in the Sahyadrian source region of many rivers and in some cases even further down. These projects, however, have a limited potential, and all the efforts made so far during the British rule and even after the independence have resulted in bringing only 12 per cent of the net-sown-area of the state under irrigation, of which over 60 per cent is irrigated by wells. The inadequate irrigation facility is plagued with a regional imbalance, a faulty distribution system and an equally faulty field practice, thus restricting the benefits of irrigation to only some parts and causing a shrinkage in irrigated acreage.

One of the spectacular effects of canal irrigation on the crop pattern of the state has been an increase in the area under sugarcane. The benefits of sugarcane cultivation are such that the availability of irrigation immediately attracts its cultivation, absorbing a large volume of water that could prove adequate for a much larger acreage under other crops. Though the irrigated acreage under sugarcane accounts for only 12 per cent of the total irrigated area, the crop is irrigated several times in a year, each time subjected to heavy flooding.

The limited irrigation that the State enjoys is not evenly distributed. Most of the major irrigation projects are located either in the Sahyadrian piedmont zone or in the extreme eastern part, undoubtedly in response to heavier rainfall, and availability of water for storage. This emphasizes the importance of ground water and well irrigation which is not only important today, but is going to remain so even in the future. For a State like Maharashtra, conservation and exploitation of ground water is as important as surface irrigation and should not be lost sight of. In addition to a very inadequate development of the State's water resources, another dimension of the problem emerges from the prosperity of small areas enjoying canal irrigation, turning into green ribbons and widening regional disparities. Thus, in the midst of agricultural poverty, there are pockets of prosperity, linear patches aligned to the canals on one or either side of the river. These green zones are invariably the plantation areas of sugarcane, and in some cases, grapes. In these pockets of affluence, the large land-owners are the main beneficiaries of irrigation since they hold much of the cultivable land. The resulting economic scene is, therefore, one of agricultural prosperity shared by a small landowning-class, leaving the rest without any visible impact. Thus, the localized agricultural prosperity has become the preserve of only a handful of the landowning peasantry who have profited from irrigation, turned sugar planters, developed sugar refineries, and, in the process, promoted what one may term *agricultural capitalism*. It is ironical that the State does not produce enough food grains and has a surplus of sugar production. The argument that sugarcane can be best, and most profitably, grown does not hold water when one looks at the interests involved; and clearly, it is of a handful of sugarcane growers locally known 'bagaitdars' who benefit from this practice and promote this line of argument, and not the common man who buys his sugar from the market at a price, much higher than what is warranted by the volume of regional production.

Excessive irrigation in some areas has given rise to the deterioration in the quality of soil and the development of alkalinity as a result of the retention of salts from the canal water. The annual flushing during the rainy season is marginal, and the yearly accumulation of residual salts reaches, in due course, an alarming proportion. A rise in the water table, which is easy to treat by recycling it back to the fields, is not always the case. Thus, irrigation by flooding has its side effects on the quality of soil and is a wasteful practice in a region where parched agricultural lands still await the arrival of irrigation. The change in the agricultural landscape brought about in the State, primarily as a result of irrigation, and the impetus. The latter offered to the cultivation of cash crops like sugarcane, fruits and vegetables is apparent, but its impact is confined to the development of islands of prosperity, centred around sugar factories and the emergence of a neo-rich landowning class, that not only influences but largely controls the politics of the State. The vast hinterland of the major industrial belts and the areas still depending on age-old methods of farming have not experienced much change. The class segmentation is further deepened and seen even in the agricultural sector, where one notices at once the very rich and the very poor, the former enjoying the benefits of irrigation and agro-industries, and latter with their tiny holdings still praying the rain-God for their living.

One of the most neglected aspects of regional development relates to the availability of water for drinking in the rural areas. Apart from the fact that clean potable water is rarely available in the rural areas, what is alarming is the unavailability of water in some villages, during the summer months. The number of such villages fluctuates depending on the intensity of drought; but even in normal years, late May witnesses many villages being supplied water from a far off source, in water carriers. The problem is age-old and the Government of Maharashtra spends enormous sum of money every year striking bore-holes to tap water in many villages. More often the action of the Government is in the form of a relief measure and not a permanent solution. The tapping of the ground water has to be preceded by a survey of the ground water conditions. It would be worth the while developing a large community well in every village that could be a perennial source of water.

Agricultural development in the State

The progress of the State in the field of agriculture is not very spectacular. Holding 12.8% of the total cultivated land of the country and accounting for 11% of the area under foodgrains, the share of production of foodgrains is a poor 7.6%. If one takes individual crops, the State produces 44% of jowar, 19% of cotton, 16% sugarcane, 8.6% of groundnut and 12% of bajri produced in the country. During a twenty year period from 1960 to 1981, the State has increased the production of foodgrains from a mere 7.7 million tons to 9.73 million tons, an increase of 25% partly as a result of increase in yields, and partly attributed to the increase in the acreage under foodgrains, from 12.9 to 14 million hectares.

Industrialization : Its benefits and problems

By any reckoning, Maharashtra is the most industrialized State of India, not only generating capital and adding to the national income but also providing employment and thus helping a wider spread of the benefits of industrialization. The State accounts for one fourth of the total industrial production of the country. With a variety of industries which are comparable to the best in any other part of India, the State has almost a representative spectrum except a few which are oriented to bulky raw material. The Bombay-Pune core industrial region of the State boasts of not only the traditional textiles, but has, over the decade, added to its growing agglomeration, machine manufacturing, electrical goods, chemicals, plastics, automobiles, electronics and a host of other major and minor industries. The resulting industrial landscape is a national show-piece and a symbol of India's industrial advance. Bombay with the head-quarters of the Reserve Bank of India, the oldest stock-exchange, the most important port, and providing the infra-structure and the necessary technical manpower, functions as the nerve centre of this region. The advantages of the region, more specifically capital, manpower, energy, transport and accessibility to market, have attracted industrialists not only from Maharashtra, but from all over the country. The process has not yet come to an end despite the congestion, frequent labour trouble, high wages and costlier overheads, but the advantages far outweigh the disadvantages and this industrial cluster is growing larger every day.

There are over fifteen thousand (15,254) factories located in different parts of the State, but largely concentrated in Western Maharashtra. Though apparently these form only 10% of the total number in the country, their contribution to the national industrial production is far greater. In terms of the capital and manpower employed and the volume of industrial production, Maharashtra claims a much higher share than is warranted by its area and population. The industries in the State are large-scale enterprises employing 18% of the total industrial manpower of the country, and with only 16.4% of the productive capital, the State has an industrial production valued at Rs. ten thousand crores ex-factory price, which is as much as one fourth of the value of the total industrial production in the country. The growth and importance of industries in the State can be judged from the fact that 58% of the total electricity generated in the State is consumed by industries alone.

While the industries have brought a semblance of prosperity in the State by producing more capital and consumers goods and offering gainful employment to the people, they have also created many problems, born out of their indiscriminate locations.

In an agricultural country where industrialization is considered synonym to development, industries are the most welcome institutions and not only receive priority in the provision of infrastructure but also steamroll their way in choosing a location, demanding all possible concessions including a modification of the existing landuse zoning, to suit them. The industrial development in Western Maharashtra and particularly in the Bombay-Pune zone during the last 25 years has witnessed a haphazard growth of the industries. There are no definite industrial zones where all the industries could be located. The latter have chosen land at random. The result is an interdigitation of industrial and residential areas. It is not uncommon to find residences in the shadow of industries, or industries on the periphery of the existing settlements. The problem is aggravated by a complete disregard of the human factor and the neglect of the labour force employed either in large industrial plants or small scale industries. While the industries contribute a great deal to the national wealth and regional development, their impact on the urban landscape is far from positive. They are, in no small measure, responsible for the urban slums since residential accommodation for the labour does not seem to figure either in the industrial policy of the Government or in the projects launched by entrepreneurs. The result is a disaster. The labour finds a place in a nearby rural settlement, completely defacing it, or in an existing slum, or develops a new shanty town. Thus, while the industrial landscape of the State particularly of Bombay-Pune region, has a bright side, it has also a dark side, reflected in the growth of slums, a phenomenon that underscores the importance of habitat planning concurrently with industrial expansion. What with *Jhopadpattis* ever on the increase and the administrative apparatus unable to cope up with the situation, the gains of industrialization are stigmatized. The phenomenon needs serious thought for locational planning of industries. What appears clear is that the town and landuse planners work on drawing boards in their offices, but the actual regulation and control of landuse in the field is purely a politico-administrative affair.

While the gains of industrialization are understandable, the ill effects of the concentration of industries are visible in the landscape and have adversely touched the life of the citizens. The worst sufferers are those who have nowhere to go to, and *par force* resort to living in hovels which have appeared following the rapid growth of industries.

Urban development

The urban development in Maharashtra is a by-product of industrialization. With thirty-four per cent of the State's population living in towns and thus presenting a contrast with the national average of 22%, Maharashtra is the most urbanized State in the country and has 276 large and small settlements classed as towns. What is not apparent is the fact that over half of the State's urban population lives in only two cities, viz. Bombay and Pune. Bombay alone accounts for about 40% of the total urban population of the State with Pune holding another 10%. The Bombay-Thane and Pune metropolis have together 55% of the urban population of Maharashtra, creating an axial urban belt riddled with problems of urbanization. While the growth rate of the total population of the State has declined from 27% in (1961-1971) decade, to 24% in 1971-81 decade, the growth rate of urban population has lingered around 40.33% in sharp contrast to the rural population growth of only 17.7%. Against the backdrop of an increase in urban population of over 40%, the contribution of a few million cities is spectacular. Bombay, Thane and Pune can be mentioned as examples. These three cities have grown by 38.38%, 80.43% and 48.64% respectively during the decade 1971-81. Since these already have a large population, even a moderate growth rate means considerable addition to the existing population.

Urban Population and the growth rate of a few towns

Bombay		Urban Population (1981) (000)	% of the State's Urban Population	Change in urban population 1971-81
Maharashtra	..	21,994	100%	40.33
Greater Bombay	..	8,243	37.48	38.38
Thane	..	1,486	6.76	80.43
Pune	..	1,971	8.96	48.64
Nagpur	..	1,469	6.68	39.55
		13,169	59.88	

These four million cities which together account for 59.88% of the urban population of the State are the scene of some of the worst urban landuse problems. The rapid growth of the cities fed by a continuous rural-urban stream has added a large number to the unbearably large volume of existing population, and has brought in its wake a host of problems which include not only inadequacy of housing and other urban amenities but even a social tension resulting from the immigration of diverse groups. The limited job opportunities and the increasing number of job seekers pose a threat to the employment prospects of the established urban dwellers who face a challenge from the new immigrants.

Rural-urban migration, overcrowding and slums

It is an established fact that the towns grow more because of immigration than natural growth. The unemployment and poverty in the rural areas work as a push propelling men in working age-group to the towns. The greater the employment opportunity, the larger is the stream of migrants. This influx has created unsurmountable problems, but the most spectacular are the squalor ridden slums. It is estimated that about half the population of Bombay lives in slums which have attained permanence, and represent the worst of human indignity and degradation. Apart from straining civic amenities as a result of overcrowding, the slums are the breeding grounds for all kinds of vices and epidemics. The shanty towns, as witnessed in Bombay, are dehumanizing in their impact and a disgrace to the City and the urban way of life in India.

The restrictive policy of the Government, urban land ceiling laws, sky rocketting cost of building construction, coupled with the inability of the Government either to provide accommodation to the city dwellers at a reasonable cost or to check the rising prices, leave the well-to-do on the mercy of the building contractors, and the poor to fend for themselves. The latter find a shelter in some slums maintained under the patronage of a slum lord. It is not that the metropolitan Bombay has grown to

an unimaginable size. There are many other towns in the world equally large, but in the developed countries, there has often been a massive housing programme and a concurrent development of infrastructural facilities. What has happened in Bombay is not only an unparalleled growth of population but also a phenomenal growth of industries and other economic activities, with no provision for living space for the growing manpower. With a poor or almost non-existent bargaining capacity, the labour found a solution to the residential problem in squatting, pitching a tent in droves, and developing fragile makeshift shelters, which, in due course, became permanent not because of their choice but out of compulsion.

A growing labour force in both formal and informal sector, it appears, is neither the responsibility of the Government nor of the entrepreneurs, ordinary businessmen or the contractors who employ them.

Can development of smaller centres solve the problem ?

The incapacity of the society to develop housing accommodation in the fast growing cities has necessitated a transfer of population from the large metropolitan cities to other areas. The problem is seen as overcrowding and a solution is sought by dispersing the economic activities to smaller towns. While this will be a step in establishing a regional balance, in the absence of a definite policy to make housing an integral part of industrial development, it will only distribute the problem, not eliminate it. The malady of slum development has spread to all such towns in India as have experienced industrialization. A case in point is Pune, which, with a population of only a few hundred thousand some thirty years ago and now touching the two-million mark, has fast turned into a slum-city. The unauthorised slums, often named after national leaders, like 'Indira Jhopadpatti', 'Kasturba Jhopadpatti' carry a socio-politic overtone and stand defiantly, more as a reminder to the society of its failures and obligations than as a challenge to law enforcing authorities. The slum-dwellers constitute a 'vote bank' of the Corporators and members of Legislative Assemblies, enjoy their protection, and receive, in due course, official recognition and the benefits that flow from it, like the rationed supply of food grains, piped water, electricity and roads for internal circulation. This is a humanitarian step and only partly ameliorates the living conditions of the slums. The ultimate remedy lies not in disowning responsibility, demolishing the slums, and driving the residents away, which in itself is far from easy but in understanding the genesis of the slums, treating the entire issue as a national problem and providing accommodation to the workers by launching a massive housing programme. With an accelerated rate of industrialization that is likely to be witnessed in the coming decades, there is bound to be a concentration of population in certain areas as an indispensable accompaniment of the industrial growth. The cure lies in meeting the demand for housing and not overlooking it till it becomes unbearable.

Environment

A continuing population growth-rate of over 2% annually has subjected the resources of the State to an unprecedented strain. The worst sufferer are the forests which are continually encroached upon for food, fodder, fuel or timber in an unauthorised way. Though, there are hardly any private forests, the State Forest Department is not in a position to adequately protect the forests. The forests have consequently shrunk over the decades, though on record the forest-area shows an increase. In many cases, and particularly in heavy rainfall areas, the tribal communities burn and clear the undergrowth of the forests and practise shifting cultivation. This is not only destructive of forests, but exposes the soils particularly on the slopes to erosion. Such shifting cultivation is most common in Peint and Surgana talukas of Nashik district, in the hilly parts of Raigad and Thane districts and the Koyna valley, where an estimated 10 to 20,000 hectares of land suffers from shifting cultivation.

An industrialized state, more than others, has to monitor its air and water which are likely to be polluted by the burning of the enormous quantity of fuel, emission of toxic gases, and the discharge of effluent in the river water. The latter, more than anything else, could pollute water bodies, particularly creeks and rivers in the vicinity of chemical plants, and occasionally may even affect ground water. While the risks are great and the society has to guard against pollution of air and water and degradation and destruction of soil and plant cover, caution has to be exercised in making an environmental issue of every activity intended to promote the welfare of the common man.

Industrialization and crowding of population in specific areas carries serious hazards, not the least of which is pollution and destruction of environment. Environment of the State is a natural legacy which needs to be jealously guarded and preserved.

Transport and Development

Inadequate and inefficient route system is a bottleneck in the development of a region. Isolation leads to stagnation, loss of mobility and economic poverty. Such areas of the State as do not have the benefit of access to major centres of industry and trade have suffered an incalculable damage. This is true of Marathwada, Konkan and the other remote parts of the State. Though there is a fairly good network of roads in Maharashtra, many of the routes need upgrading and proper maintenance. The Marathwada area needs special attention. Not a single national highway passes through the districts of Marathwada. In public debates, one hears more often the need for a Konkan railway. While one cannot deny the importance of a railway along the Arabian sea board, a far more pressing need is to link Central Marathwada by a broad-gauge railway line. It is not only the conversion of Latur-Miraj railway into a broad-gauge, but the entire stretch of Godavari valley railway which could be streamlined and the region could be directly linked with Bombay, Pune, Hyderabad and Madras. Besides the unfavourable physical conditions—low rainfall and poor soil — the Marathwada area suffers from isolation. Despite the fact that most, if not all, districts of Marathwada are no-industry backward areas, the industries do not, and would not, move in, in the absence of an efficient transport and infrastructure, and would cling to the Bombay-Madras, Bombay-Calcutta, Bombay-Ahmedabad or Bombay-Bangalore railway line. The physical barriers like mountain ranges and their offshoots and dissected terrain are not as numerous in Central Maharashtra as in Western Maharashtra, yet transport system has remained neglected. The national highways confined to only western and northern Maharashtra either along the coast or parallel to the main railways have not penetrated this neglected region. By laying a well knit transport system, this neglected region could be exposed to the development processes operating elsewhere, and in turn could absorb modern techniques and benefit from them. An improved transport system will not only promote rapid development but could be instrumental in propagating innovations and ideas.

Social problems and challenges

Like many other states of India, Maharashtra has a dominant caste, the Marathas, who dominate the politics of the State. The political stability of the State can be judged from the fact that there has never been a President rule in the State. But despite the political stability, the State faces many challenges of a social nature. There are sectional interests that voice their grievances arising out of regional disparity in development. Vidarbha, Marathwada and Konkan, the three regions that feel underprivileged *vis-a-vis* Western Maharashtra demand a larger share in the developmental budget. In consequence, Konkan has acquired a separate development board, and Vidarbha and Marathwada may soon have their own statutory development promotion agencies. The regional interests are not the only issues that breed dissatisfaction; even the caste prejudices and the grievances of the disadvantaged, particularly the scheduled castes, often come to the fore and occasionally erupt into clashes. About 12% of the State's population is composed of scheduled castes and scheduled tribes, with an above average concentration in certain areas (scheduled castes in Marathwada and scheduled tribes in Dhule, Thane, Raigad and Chandrapur districts). These pockets of scheduled castes and tribes' concentration are also economically depressed, not so much because of the contemporary neglect as because of their history and locational characteristics. There is no doubt that far more vigorous and intensive efforts are needed to bring these areas at par with the rest of the State. The regional disparities as well as the inherited disabilities and economic inequality, often caste based, can be minimized and finally eliminated with a sense of commitment on the part of the State and its people, and the neglected section of the society can be brought in the mainstream of the life of the State.

Maharashtra, undoubtedly, is one of the developed states of India, and this development owes itself largely to the growth of industries and the concentration of other non-agricultural economic activities in the Western part of the State of which Bombay is the focal point. The 'Bombay-Thane-Pune' region together with Kolhapur stands as an island of prosperity in an otherwise not so developed a universe. The development radiating from Bombay and confined to the narrow zone along the transport routes, has hardly touched the remaining two-thirds of the State which have not experienced comparable progress and lag behind. The developed Western region is only a part of Maharashtra and not the whole of it. The tribal hilly belt of Thane, Kolaba, Nashik and Dhule districts, the Marathwada districts representing the dry core of Maharashtra, the Eastern hilly region which suffers from remoteness and isolation, and finally the Konkan, from where Bombay derives much of its labour force, await intensive planned efforts to elevate the peasantry and the tribal population, from the perpetual fear of drought, scarcity and unemployment, to a life of assured living means.

The State has a rich religious tradition and the lofty ideals of universal brotherhood have been preached by Saints like Dnyaneshwar and Tukaram and later Jyotiba Phule. The concern for the poor, downtrodden and the under-privileged is evident even today in a multitude of Ashrams, orphanages, Leper homes, homes for handicapped and the like. In a land of such illustrious traditions, the eruption of social discord is a paradox. There is a need to remind oneself constantly of the ideals preached by the Saints of yore. In a society riddled with poverty and ignorance, a harmonious life could provide a healing touch and induce the people to engage in productive occupation and hard work. Social discord, on the other hand, not only saps the energy of the society but also generates hatred and kills the creativity in man. Some of the worst communal riots that the State has witnessed in recent years are a pointer to the fact that group identities are still strong and erupt into violence whenever there is a conflict of interests. One of the basic principles to follow is not to think in terms of social or religious groups that narrow our perspective and restrict freedom. Perhaps, a better approach would be to think and plan for the optimal utilization of the resources of the land and the available manpower, since much of the social discord emanates from the limited availability of goods, services and employment and other opportunities and their distribution. In a country suffering from material poverty and shortages of all kinds, conflicts cannot be entirely eliminated but they can be minimized with goodwill and understanding among people of different denominations.

□ □

APPENDIX I
MAHARASHTRA AT A GLANCE

General Information

(1) Area in Sq. Km.	..	307,690	
(2) Population (1981)	..	62,784,000	
(i) Rural Population (1981)	..	40,791,000	64.97%
(ii) Urban Population (1981)	..	21,993,000	35.03%
(iii) Percentage of rural population to total population	..		64.97%
(iv) Percentage of urban population to total population	..		35.03%
(v) Percentage of S.C. & S.T. population to total population	..		16.3%
(vi) Density of population per sq. km.	..		204
(vii) Percentage growth of population during 1971-81	..		24.75%
(3) Number of administrative Divisions	..		8
Number of Districts	..		30
Number of Talukas	..		302
Number of city & town units/UAS	..		307
Number of villages	..		39,354
Number of cities having population of more than one lakh	..		25
(4) Agriculture :—(1979-80)			
Culturable area (sq. km.)	..	211,890	68.86%
Net sown area (sq. km.)	..	182,740	59.39%
Gross sown area (sq. km.)	..	190,986	
Gross area irrigated (sq. km.)	..	25,160	8.17
Area under forest (sq. km.)	..	63,920	20.77
(5) Total length of coast line (in km.)	..	720	
Total Railway length km. (as on March 1982)	..	5,233	
Total length of Roads (in km. as on March 1983)	..	145,495	
Industry			
(i) Working factories (1978)	..	13,250	
(ii) Average daily number of workers in '000	..	1,189	
Electricity			
(i) Electricity generated (million kwh 1981-82)	..	19,769	
(ii) Electricity consumed (million kwh 1981-82)	..	14,951	
State Income			
(i) Income at current prices (1982-83)	..	Rs. 16,272 crores	
(ii) Per capita income at current price	..	Rs. 2,525	

APPENDIX II
MAHARASHTRA AT A GLANCE
Comparison with India

Item 1	Unit 2	Maharashtra 3	India 4	Comparison of Maharashtra with India (Percentage) 5
Area	.. Sq. km.	307,690	3,287,263	9.36
Population (1981 Census) Total Population	.. In '000	62,784	685,185	9.2
(i) Male	.. ..	32,415	354,398	9.4
(ii) Female	.. ..	30,369	330,787	9.5
(a) Rural population	.. ..	40,791	525,457	7.8
(b) Percentage of rural population to total population.	.. Percentage	64.97	76.69	...
(a) Urban population	.. In '000	21,993	159,727	13.8
(b) Percentage of urban population to total population.	.. Percentage	35.03	23.31	...
(a) Population of S.C., S.T.	.. In '000	10,252	156,383	6.6
(b) Percentage of S.C. & S.T. population to total population.	.. Percentage	16.3	22.8	...
(a) Total main workers	.. In '000	24,302	222,517(a)	10.9 (a) Provisional and excluding Assam.
(b) Percentage of total main workers to total population.	.. Percentage	38.7	33.5	...
Density of population	.. Persons per sq.km.	204	216++	... ++ Excluding J & K.
Literacy percentage				
(1) Male	.. Percentage	58.79+	46.89	... + Revised and final.
(2) Female	.. ..	34.79+	24.82	...
(3) Persons	.. ..	47.18	36.23	...
Sex Ratio	.. Females per 1000 males	937+	933	...
Percentage growth of population during 1971-81	.. Percentage	24.75	25.00	...
Agriculture				
Area under Principal crops (Averages for years 1980-81, 1981-82 & 1982-83).				
Rice	.. '000 Hect.	1502	39,541	3.8
Wheat	.. ..	1,077	22,519	4.8
Jowar	.. ..	6,554	16,173	40.5
Bajri	.. ..	1,617	11,438	14.1
All cereals	.. ..	12,247	103,438	11.8
All Pulses	.. ..	2,711	22,892	11.0
All foodgrains	.. ..	13,958	126,330	11.0
Groundnut	.. ..	808	7,192	11.2
Sugarcane	.. ..	293	3,075	9.5
Cotton	.. ..	2,677	7,985	33.5
Outturn of Principal crops (Averages for years 1980-81, 1981-82 & 1982-83).				
Rice	.. '000 Tonnes	2,248	51,112	4.4
Wheat	.. ..	908	38,747	2.3
Jowar	.. ..	4,657	19,056	42.2
Bajri	.. ..	661	5,337	12.4
All cereals	.. ..	8,904	119,138	7.5
All Pulses	.. ..	944	11,231	8.4
All foodgrains	.. ..	9,849	130,369	7.6
Groundnut	.. ..	677	5,927	11.4
Sugarcane	.. ..	13,619	176,578	7.7
Cotton	.. ..	247	1,282	19.3
Forests (1978-79)				
Total forest area	.. Sq. km.	63,920	747,413	8.6

* Includes projected population of Assam, where Census could not be held but excludes population of areas in J & K under unlawful occupation at Pakistan and China where Census could not be taken.

APPENDIX II—*contd.*

Item 1	Unit 2	Maharashtra 3	India 4	Comparison of Maharashtra with India (Percentage) 5
Industry and Mining				
Factories				
(a) Working factories (1978)*.	.. No.	13,250	126,236	10.5 * Provisional and inclusive of defence factories.
(b) Average daily No. of workers (1979)	.. '000	1,189	6,799	17.5
** Annual survey of industries (Census plus non census part 1979-80).	..			** Provisional.
(a) productive capacity	.. Crore Rs.	6,104	37,889	16.1
(b) No. of persons employed	.. '000	1,342	7,678	17.5
(a) Working cotton textile mills (end of 1981).	.. No.	105	723	14.5
(b) Average monthly production of yarn (end of 1981).	.. Lakh kg.	221.07	1,068.84	20.7
(c) Average monthly production of cloth (end of 1981).	.. Lakh mts.	1,223.32	3,393.78	36.1
Mining (1982)				
(a) Coal quantity	.. '000 tonnes	7,593	1,28,225	5.9
Coal value	.. Crore Rs.	103	2,020	5.1
(b) Iron Ore quantity	.. '000 tonnes	1,006	40,902	2.5
Iron Ore value	.. Crore Rs.	4	140	3.1
(c) Manganese Ore quantity	.. '000 tonnes	237	1,448	16.4
Manganese Ore value	.. Crore Rs.	8	30	24.0
(d) Bauxite quantity	.. '000 tonnes	348	1,854	18.8
Bauxite value	.. Crore Rs.	1	9	15.5
Electricity				
Electricity generated 1981-82	.. Million kwh.	19,769	121,970	16.2
Electricity consumed 1981-82	.. ..	14,951	90,237	16.6
Percentage of Industrial consumption to total consumption.	.. Percentage	57.5	58.8	...
Co-operation (1979-80)				
Co-operative societies	.. No.	57,352	309,889	18.5
Transport and Communication				
(a) Total Railway length as on 31st March 1982.	.. Kms.	5,233	59,781	8.7
(b) Railway length per 100 sq. km. of area (as on March 1982).	.. ..	1.7	1.9	...
Road length per 100 sq. km. of area (as on 31st March 1981).	.. Kms.	58	47	...
(a) Motor vehicles per 100 sq. km. of area (as on 31st March 1981).	.. Number	271	157	...
(b) Motor vehicles per lakh of population (as on 31st March 1981).	.. ..	1,328	755	...
State Income				
(a) Income at current prices (1982-83)	.. Crore Rs.	16,272**	134,066***	12.14
(b) Per capita income at current prices	.. Rs.	2,525	1,891	...

** Preliminary.

*** Quick estimates.

APPENDIX III
MAHARASHTRA STATE
LAND UTILISATION

(In '000 hectares)

Item	1979-80	1980-81	Percentage of the area of State
1. Total geographical area of the State (by village papers) ..	30,758	30,758	
2. Area under forest ..	5,300	5,309	17.26
3. Barren and unculturable land ..	1,733	1,733	5.63
4. Land put to non-agricultural uses ..	975	993	3.228
5. Culturable waste ..	1,009	993	3.228
6. Permanent pastures ..	1,561	1,591	5.17
7. Land—miscellaneous, tree, crops etc. ..	191	186	0.60
8. Current fallows ..	844	852	2.77
9. Other fallows ..	871	802	2.60
10. Net sown area ..	18,274	18,299	59.49
11. Area sown more than once ..	1,717	1,834	5.96
12. Cross cropped area ..	19,991	20,133	65.45

Source — Handbook of Basic Statistics of Maharashtra State, 1983.
 Government of Maharashtra, Bombay.
 Director of Agriculture, Government of Maharashtra, Pune.

APPENDIX IV

MAHARASHTRA DISTRICTWISE LAND UTILIZATION

Area in '000 hectares

Districts	Total Geog. area	Culturable area	Net sown area	Gross sown area	Area under forests*	Net irrigated area 1975-76
1. Greater Bombay ..	38	9	6	7	5.156	...
2. Thane ..	934	338	264	274	425.92	4.036
3. Raigad ..	687	327	195	209	187.88	7.43
4. Ratnagiri ..	1,279	859	360	373	57.19	10.21
5. Nashik ..	1,563	1,018	894	957	347.42	67.41
6. Dhule ..	1,438	731	706	790	445.48	43.16
7. Jalgaon ..	1,164	851	813	950	197.16	76.23
8. Ahmednagar ..	1,702	1,391	1,235	1,394	191.60	151.99
9. Pune ..	1,562	1,081	1,002	1,130	209.41	124.49
10. Satara ..	1,058	683	572	670	157.91	75.12
11. Sangli ..	861	729	609	662	48.75	51.79
12. Solapur ..	1,501	1,333	1,126	1,208	37.51	55.06
13. Kolhapur ..	818	558	427	443	172.14	...
14. Aurangabad ..	1,627	1,379	1,258	1,362	98.08	87.14
15. Parbhani ..	1,250	1,110	998	1,107	37.65	32.56
16. Beed ..	1,117	1,009	809	837	21.50	52.53
17. Nanded ..	1,033	832	744	797	118.76	22.62
18. Osmanabad ..	1,403	1,323	1,120	1,241	5.70	87.33
19. Buldhana ..	967	747	681	786	155.84	19.83
20. Akola ..	1,056	862	823	873	85.882	13.91
21. Amravati ..	1,222	776	724	748	375.50	23.61
22. Yavatmal ..	1,352	948	848	869	371.15	11.34
23. Wardha ..	629	471	437	459	88.59	11.25
24. Nagpur ..	986	618	556	586	275.25	38.10
25. Bhandara ..	928	453	383	509	456.07	143.19
26. Chandrapur ..	2,583	827	686	745	1,836.32	106.02
Maharashtra ..	30,758	21,189	18,274	19,986	6,407.83	...

Note.—Culturable area includes (1) Culturable waste, (2) Land under miscellaneous tree, crops etc. (3) Current fallows, (4) Other fallows, (5) Net sown area.

Source.—Handbook of Basic Statistics of Maharashtra State, 1983.

Government of Maharashtra, Bombay, pp. 27-28.

* Forest Statistics of Maharashtra.

Maharashtra forests—A statistical outline 1981.

APPENDIX V

TRENDS-SELECTED INDICATORS

Maharashtra

	1950-51	1955-56	1960-61	1965-66	1970-71	1975-76	1980-81
Total Geographical area as per village papers (sq. km.)	307,483	...	307,575	307,687	307,583	307,583	307,690
Population							
Total population	32,002,564		39,553,718		50,412,235		62,784,000
Total Rural population	22,801,551	...	28,391,157		34,701,024		40,790,577
Total Urban population	9,201,013		11,162,561		15,711,211		21,966,806
Density of population per sq. km.	104		129		164		204
No. of towns	383**		266		289		307
No. of villages (inhabited)	...		35,851		35,778		39,354
Literacy percentage	20.9**		29.8**		39.1		47.18@
Total main workers in '000	...		18,948		18,390		24,302@
Percentage of total main workers to total population.	...		47.9		36.6		38.7
Number of factories	5,439 estimated	6,979	8,010	9,472	9,803	11,425	16,594 estimated
Total No. of co-operative Societies	...		31,565	37,404	42,603	49,651	60,747
Electricity							
Electricity generated in million kwh.	1,541	2,249	3,268	5,635	9,135	12,052	19,769
Electricity consumed in million kwh.	1,341	1,927	2,720	4,717	7,650	9,410	14,951
Agriculture							
Net sown Area (in sq. km.)	1,67,608	...	178,781	181,329	176,682	182,616	182,990@
Gross cropped area (in sq. km.)	173,125	...	188,227	189,721	187,369	196,639	201,330@
Net area irrigated (in sq. km.)	8,510	9,143	10,722	12,063	13,672	16,121	18,958
Gross area irrigated (in sq. km.)	9,599	10,517	12,198	1,388@	16,216	19,328	26,860
Area under forest (in sq. km.)	58,278	54,137	54,110	54,173	54,168	53,337	64,078+
Primary Education							
No. of Institutes	22,444**	28,758	34,595	41,781	45,143	48,299	51,534@
No. of pupils	2,501	3,066	4,148	5,535	6,229	6,993	8,674@
Secondary Education							
Number of Institutions	1,137	1,018	2,468	4,032@	5,339	5,810	6,237@
Number of pupils ('000)	393	500	858	1,500@	1,936	2,442	3,522@
Higher Education							
Number of Institutions	105	132	211	361	547	546	...
Number of pupils (in '000)	42	65	110	189	328	527	...
Length of Roads as on 31st March of each year (in kms.)	...	**33,813	39,241	48,053	62,703	158,928 @	141,131@

* Indian Agricultural Statistics, 1974-75 to 1978-79, Vol. I (Summary tables).

@ Handbook of Basic Statistics of Maharashtra, 1983.

** Handbook of Basic Statistics of Maharashtra, 1969.

Statistical Abstract of Maharashtra State, 1975-76.

+ Maharashtra forest—A statistical outline, 1981.

APPENDIX VI

MAHARASHTRA—DISTRICTWISE POPULATION STATISTICS, 1981

MAHARASHTRA—DISTRICTWISE

Districts	Area sq. km.	Total population	Decennial growth rate % (1971-81)	Density of population sq.km.	Rural population in '000
1. Greater Bombay ..	603	8,243	38.38	13,644	...
2. Thane ..	9,558	3,352	47.28	349	1,865
3. Raigad ..	7,148	1,486	17.84	208	1,277
4. Ratnagiri ..	8,249	1,380	6.11	167	1,259
5. Sindhudurg*	5,219	773	...	148	722
6. Nashik ..	15,530	2,992	26.49	192	2,064
7. Dhule ..	13,150	2,050	23.55	156	1,650
8. Jalgaon ..	11,765	2,618	23.52	223	1,960
9. Ahmadnagar ..	17,048	2,708	19.52	159	2,357
10. Pune ..	15,642	4,164	31.30	266	2,193
11. Satara ..	10,484	2,039	18.17	195	1,773
12. Sangli ..	8,572	1,831	19.08	213	1,437
13. Solapur ..	14,874	2,591	15.94	174	1,824
14. Kolhapur ..	7,633	2,465	22.57	323	1,843
15. Aurangabad ..	9,172	1,588	23.66	173	1,194
16. Jalna*	8,656	1,032	...	119	1,873
17. Parbhani ..	11,038	1,643	21.59	149	1,316
18. Beed ..	10,624	1,412	15.67	133	1,183
19. Nanded ..	10,502	1,749	25.36	166	1,421
20. Osmanabad ..	7,510	1,030	17.76	137	900
21. Latur*	7,304	1,293	...	177	1,080
22. Buldhana ..	7,661	1,509	19.62	156	1,230
23. Akola ..	10,575	1,827	21.86	173	1,372
24. Amravati ..	12,212	1,861	20.95	152	1,317
25. Yavatmal ..	13,584	1,737	22.23	128	1,475
26. Wardha ..	6,310	927	18.02	147	695
27. Nagpur ..	9,931	2,589	33.54	260	1,120
28. Bhandara ..	9,213	1,838	16.02	199	1,597
29. Chandrapur ..	10,490	1,418	25.54	135	1,172
30. Gadchiroli*	15,433	637	...	41	621
Maharashtra State ..	3,07,690	62,784	24.75	204	40,791

* Decennial growth rate for reorganised districts is based on the information prior to re-organisation. No growth rate is given for the newly created districts marked (*).

VI

POPULATION STATISTICS, 1981

No. of villages inhabited (1971)	Urban Population in '000	No. of Towns and Urban Agglomeration	Sex ratio (**)	Literacy %	Percentage of S.C. to total population	Percentage of S.T. population to total population
...	8,243	1	772	68.18	4.84	1.02
1,588	1,486	24	883	50.50	2.50	21.16
1,699	210	16	1,047	45.59	1.69	12.80
1,514	120	13	1,258	47.75	1.09	1.94
1,628	57	15	1,204	44.36	4.04	0.86
1,379	928	7	938	44.36	6.21	23.45
1,423	400	14	966	37.51	4.18	40.53
1,312	658	7	950	48.14	5.84	8.25
1,481	351	7	959	43.16	10.62	6.93
1,142	1,971	17	938	54.03	7.54	3.88
539	266	10	1,061	48.15	6.21	0.64
948	394	6	967	46.87	11.16	0.85
1,083	767	10	942	40.68	14.31	1.96
1,866	622	11	963	45.36	12.23	1.04
1,505	394	9	936	35.80	5.95	3.68
1,028	160	12	970	30.33	6.55	1.96
1,324	326	7	967	31.79	11.17	0.87
1,387	230	11	965	29.78	11.30	10.19
1,232	328	13	958	35.36	14.07	1.88
1,489	130	9	959	44.64	6.18	4.40
1,637	213	9	949	47.82	5.51	6.28
1,647	279	12	937	51.82	6.06	12.98
962	455	8	959	39.29	4.95	21.30
1,625	231	6	948	51.05	3.93	15.35
1,500	1,469	14	925	54.56	7.05	13.65
2,840	241	7	997	43.92	9.75	16.22
35,778	246	8	959	13.69	6.86	39.52
	15		981		6.39	21.07
	21,994	276	937	47.18	7.14	9.19

Source.—(1) Census of India 1981, Series 12, paper 1, b. 8.

(2) Handbook of Basic Statistics of Maharashtra State, 1983, Government of Maharashtra.

(3) Census of India 1971, Series 11, Maharashtra, Part II-A, General population tables.

(4) Census of India 1981, Series 12, Maharashtra, Part II-B.

** Females per thousand males.

APPENDIX

MAHARASHTRA—POPULATION OF CLASS I AND
(from 1901)

Cities	District	1901	1911	1921
Maharashtra State	..	1,665,729	1,820,582	2,303,238
1. Greater Bombay (M. Corp.)	.. Greater Bombay	812,912	1,018,388	1,244,934
2. Pune Urban Agglo.	.. Poona	164,117	172,884	198,543
(a) Pune city (M. Corp.)	.. ..	153,320	158,856	198,543
(b) Pimpri-Chinchwad city (M)	.. ..	.....	.....	.....
(c) Pune Cant.	.. ..	.....	.....	.....
(d) Khadki Cant.	.. ..	10,797	14,028	.....
(e) Dehu Rd. Cant.	.. ..	.....	(Treated as Town for the	.....
(f) Hadapsar	.. ..	.....	.....	.....
(g) Lohagaon	.. ..	.....	.....	.....
(h) Khadakwasla	.. ..	.....	.....	.....
(i) Dehu	.. ..	.....	.....	.....
3. Nagpur Urban Agglo.	.. Nagpur	166,622	118,570	165,419
(a) Nagpur city (M. Corp.)	.. ..	127,734	101,415	145,193
(b) Kamptee (M)	.. ..	.....	.....	.....
(c) Kamptee (cant.)	.. ..	38,888	17,155	20,226
4. Ulhasnagar Urban Agglo.	.. Thana	10,749	12,600	17,829
(a) Ulhasnagar City (M)	.. ..	.....	.....	.....
(b) Kalyan city (M)	.. ..	10,749	12,600	17,829
(c) Dombivli City (M)	.. ..	.....	.....	.....
(d) Ambarnath (M)	.. ..	.....	.....	.....
(e) Katemanivli	.. ..	.....	.....	.....
(f) Mohane	.. ..	.....	.....	.....
5. Sholapur city	.. Solapur	75,288	61,345	119,581
6. Nasik urban Agglo.	.. Nasik	24,384	31,932	57,019
(a) Nasik city (M)	.. ..	21,490	30,098	38,230
(b) Nasik Road Deolali (M)	.. ..	.....	.....	.....
(c) Deolali Cant.	.. ..	2,894	1,834	18,789
(d) Satpur (M)	.. ..	.....	.....	.....
(e) Bhagur (M)	.. ..	.....	.....	.....
7. Thana Urban Agglo.	.. Thana	16,011	15,591	22,639
(a) Thana City (M)	.. ..	16,011	15,591	22,639
(b) Manjivade	.. ..	.....	.....	(Treated as town
(c) Kalwa	.. ..	.....	.....	.....
8. Kolhapur Urban Agglo.	.. Kolhapur	54,373	42,018	52,299
(a) Kolhapur City (M. Corp.)	.. ..	54,373	42,018	52,299
(b) Gandhinagar	.. ..	.....	.....	.....
9. Aurangabad Urban Agglo.	.. Aurangabad	36,837	34,902	36,876
(a) Aurangabad	.. ..	.....	.....	.....
(b) Aurangabad Cant.	.. ..	.....	.....	.....
10. Sangli Urban Agglo.	.. Sangli	35,254	37,309	41,790
(a) Sangli City (M)	.. ..	16,829	16,141	20,366
(b) Miraj City (M)	.. ..	18,425	21,168	21,424
(c) Madhavnagar	.. ..	.....	.....	(Treated as town
11. Amravati City	.. Amravati	39,511	40,610	45,469
12. Malegaon City (M)	.. Nasik	19,054	19,060	23,505
13. Akola City (M)	.. Akola	29,289	25,826	37,864
14. Dhule City (M)	.. Dhule	24,726	30,341	29,497
15. Nanded City (M)	.. Nanded	14,184	17,625	21,470
16. Ahmednagar Urban Agglo.,	.. Ahmednagar	35,784	33,878	49,878
(a) Ahmednagar City (M)	.. ..	35,784	33,878	49,878
(b) Ahmednagar Cant.,	.. ..	.....	.....	.....
17. Jalna City	.. Jalna	20,270	18,993	16,912
18. Ichalkaranji City (M)	.. Kolhapur	12,920	10,239	10,211
19. Bhusawal Urban Agglo.	.. Jalgaon	16,363	15,258	24,522
(a) Bhusawal City (M)	.. ..	16,363	15,258	24,522
(b) Kandari	.. ..	.....	.....	.....
20. Jalgaon City (M)	.. ..	8,487	7,552	10,207
21. Chandrapur City (M)	.. Chandrapur	17,803	19,866	22,981
22. Bhiwandi City (M)	.. Bhiwandi	10,354	13,292	12,188
23. Latur City (M)	.. Latur	10,479	7,574	16,233
24. Parbhani (City) (M)	.. Parbhani	9,958	9,081	14,755
25. Gondiya City (M)	.. Bhandara	.....	5,847	10,617

VII
CLASS II TOWNS AND DISTRICT HEADQUARTERS
to 1981)

	1931	1941	1951	1961	1971	1981
	2,604,838	3,457,568	5,839,389	8,077,409	11,573,120	16,485,332
	1,268,306	1,686,127	2,966,902	4,152,066	5,970,575	8,202,759
	250,187	324,286	606,504	790,798	1,135,034	1,685,266
	198,078	257,554	488,419	606,777	856,105	1,203,388
	....	....	9,522	27,975	83,542	220,995
	35,807	40,447	59,011	65,838	77,774	85,330
	16,302	26,285	48,552	58,496	65,497	80,787
first time in 1971 Census)					24,709	33,118
	....	....	....	....	....	20,559
	....	....	....	5,115	12,501	16,915
	....	....	....	7,355	9,270	16,650
	....	....	....	19,242	5,636	7,524
	241,506	328,887	485,264	690,302	930,459	1,297,977
	215,165	301,957	449,099	643,659	866,076	1,215,425
	20,787	22,249	31,298	40,859	53,412	67,340
	5,554	4,681	4,867	5,784	10,971	15,212
	26,291	31,356	169,365	247,250	396,384	630,758
	....	....	80,861	107,760	168,462	273,332
	26,291	31,356	58,900	73,482	99,547	135,870
	....	....	8,106	18,407	51,108	103,213
	....	....	21,498	34,509	56,276	78,966
	....	....	....	5,803	9,647	20,023
	....	....	....	7,289	11,344	19,354
	144,654	212,620	277,087	337,583	398,361	513,956
	57,347	74,167	156,888	215,576	271,681	429,420
	45,744	52,386	97,042	131,103	176,091	262,666
	....	....	26,885	40,013	55,436	77,660
	7,805	16,292	27,075	37,264	30,618	57,904
	....	....	....	....	....	19,947
	3,798	5,489	5,886	7,196	9,536	11,243
	21,816	29,751	67,759	109,215	207,352	388,577
	21,816	29,751	61,767	101,107	170,675	309,271
for the first time in 1971 Census)					22,126	48,918
	....	....	5,992	8,108	14,551	30,388
	66,728	93,032	136,835	193,186	267,513	351,073
	66,728	93,032	136,835	187,442	259,050	340,306
	....	....	....	5,744	8,463	10,767
	36,870	50,924	66,636	97,701	165,253	315,997
	29,288	41,644	57,949	87,579	150,483	298,501
	7,582	9,280	8,687	10,122	14,770	17,496
	53,838	67,236	90,511	127,183	201,597	268,962
	27,373	34,781	50,287	73,838	115,138	152,382
	26,465	32,455	40,224	53,345	77,606	105,436
for the first time in 1971 Census)					8,853	11,144
	57,100	74,309	102,806	137,875	193,800	261,387
	29,442	36,780	55,022	121,408	191,847	245,382
	47,632	62,564	89,606	115,760	168,438	225,402
	39,656	53,308	76,880	98,893	137,129	210,927
	26,992	36,689	65,024	81,087	126,538	190,819
	57,529	70,418	105,275	119,020	148,405	181,081
	41,890	54,193	80,873	119,020	118,236	144,146
	15,639	16,225	24,402	....	30,169	36,935
	22,408	38,096	58,478	67,158	91,099	145,254
	11,904	18,573	27,423	50,978	87,731	133,704
	27,865	36,352	54,346	79,121	104,708	132,146
	27,865	36,352	54,346	73,994	96,800	123,127
	....	....	....	5,127	7,908	9,019
	10,463	10,599	9,764	12,117	14,788	122,246
	28,138	35,730	40,744	51,484	75,134	115,352
	15,619	18,776	25,764	47,630	79,576	115,256
	30,760	24,985	35,374	40,913	70,156	111,961
	16,830	21,683	33,446	36,795	61,570	109,328
	14,957	20,320	36,686	56,320	77,992	100,342

APPENDIX
POPULATION 1901
Class II Towns

Towns	District	1901	1911	1921
1. Yavatmal (M)	.. Yavatmal	10,545	13,525	17,238
2. Wardha (M)	.. Wardha	9,872	10,541	16,044
3. Satara (M)	.. Satara	26,022	19,145	22,454
4. Achalpur (M)	.. Amravati	26,082	13,909	23,899
5. Beed (M)	.. Beed	17,671	16,010	13,547
6. Barshi (M)	.. Solapur	24,242	16,704	20,449
7. Amalner (M)	.. Jalgaon	10,294	13,232	17,072
8. Nandurbar (M)	.. Dhule	10,922	11,510	13,550
9. Khamgaon (M)	.. Buldhana	18,341	10,123	19,962
10. Pandharpur (M)	.. Solapur	32,405	28,550	25,210
11. Ballarpur (M)	.. Chandrapur	....	....	....
12. Chalisgaon (M)	.. Jalgaon	10,243	8,956	10,622
13. Hinganghat (M)	.. Wardha	12,682	14,943	17,200
14. Bhandara (M)	.. Bhandara	14,023	7,414	13,399
15. Shirampur (M)	.. Ahmednagar	....	....	....
16. Vasai Urban Agglo.	.. Thane	10,702	9,598	10,366
(a) Vasai (M)	.. ..	10,702	9,598	10,366
(b) Manikpur	.. ..		(Treated as town for the first	
(c) Sandor	.. ..	....	....	....
17. Karad	.. Satara	11,499	11,228	11,255
18. Akot (M)	.. Akola	18,252	12,583	16,887
19. Manmad (M)	.. Nasik	7,113	6,947	11,929
20. Udgir (M)	.. Osmanabad	5,984	7,213	7,178
*21. Alibag	.. Raigarh	6,055	3,467	5,253
*22. Ratnagiri	.. Ratnagiri	16,094	15,858	14,597
*23. Osmanabad	.. Osmanabad	10,607	10,221	9,056
*24. Buldhana	.. Buldhana	4,137	3,820	5,691

* District Head Quarters which are not included in Class I or II Towns.

Source.—Census of India, 1971.

Town Directory (Part—VI-A) and

Census of India, 1981—Series 12, Paper-1. Provisional figures.

VII—*contd.*

to 1981

of 1981 Census

	1931	1941	1951	1961	1971	1981
	20,967	26,555	35,980	45,587	64,836	89,073
	19,571	28,359	39,327	49,113	69,037	88,500
	26,379	36,405	41,070	48,709	66,433	83,604
	28,592	31,475	35,712	36,538	42,326	81,166
	14,840	15,222	25,636	33,066	49,965	80,286
	27,610	34,839	41,849	50,389	62,374	72,769
	23,491	34,694	44,646	46,963	55,544	67,505
	16,741	22,139	30,144	41,055	54,070	65,379
	23,462	26,402	36,734	44,432	53,692	61,988
	29,460	33,329	40,514	45,421	53,638	64,338
	....	8,712	12,471	20,351	34,268	61,389
	16,320	22,122	30,345	34,280	41,720	59,331
	22,601	28,040	32,868	36,890	44,349	59,073
	16,738	19,708	22,640	27,710	39,423	56,029
	....	....	16,311	22,802	39,492	55,495
	12,689	13,969	19,640	28,238	44,909	52,341
	12,689	13,969	19,640	22,598	30,594	34,929
time in 1971 Census)					7,610	9,488
	....	....	....	5,640	6,705	7,924
	14,479	17,996	25,721	33,772	42,329	54,372
	18,693	22,465	24,255	31,459	41,534	51,930
	12,263	16,838	18,350	23,570	29,571	51,432
	8,308	11,238	16,522	18,814	30,647	50,566
	6,460	6,526	8,181	9,909	11,913	14,060
	17,320	17,904	27,082	31,091	37,551	47,025
	11,266	14,414	15,007	18,868	27,279	17,212
	7,504	8,849	10,797	15,985	25,303	35,914

BIBLIOGRAPHY—I
MAHARASHTRA—THE LAND

- AHMED, E. (1972)** : "Coastal Geomorphology of India"—Orient Longman.
- ARUNACHALAM, B. (1964)** : "Shifting of Water Divide in the Igatpuri—Tryambak Ghats"—Bombay Geographical Magazine, Vol. 12, pp. 9-12.
- (1981)** : "Geomorphic Lineaments of North Konkan Drainage", Ann. Ass. Geographers, India. Vol. 1 and 2, pp. 1-9.
- ATHAVALE, R. N. and ANJANEYULU, G.R. (1972)** "Palaeomagnetic Results on the Deccan Trap Lava of the Aurangabad Region and Their Tectonic Significance Tectonophysics". Vol. 14, pp. 87-103.
- BHALCHANDRA, K. B. (1949)** "A Geographical Study of Rainfall in Amraoti 1891-1930", Calcutta Geographical Review, 1949 Vol. XI, Nos. 3 and 4. pp. 25-34.
- BALAKRISHANA, S. C. and GOWD, T. N. (1970)** "Role of Fluid Pressure in the Mechanics of Transcurrent Faulting at Koyna", Tectonophysics, Vol. 9, Nos. 4, pp. 301-321.
- BLANFORD, W. T. (1872)** : "Geology of Nagpur and Its Neighbourhood", Mem., G.S.I., Vol. 9, Part-II, pp. 295-325.
- "Sketch of the Geology of the Bombay Presidency"—Geological Survey of India—Rec., Vol. 5.
- DAJI, J.A. (1955)** : "The Climate of Bombay State", Journal Indian Society of Soil Science. Vol. III, pp. 139-153.
- DESOUZA, N. C. and SADASHIVAIAH, M. S. (1968)** "Some New Observations of the Structure of Peninsular India, from Sat. Photographs", 21st International Geographical Congress, New Delhi, 1968.
- DESHPANDE, B. G. and JAGTAP, P. M. (1968)** "Tectonic Framework of the Koyna Catchment Areas—Maharashtra State."—Bull., O.N.G.C., Vol. No. 1, pp. 3-5.
- DESHPANDE, B. G. (1968)** : "Trends of Upward Movement along the West Coast"—Indian Geophysical Union Journal, Vol. 5, Part-I, pp. 28-29.
- DESHPANDE, C. D. and BHAT, L. S. (1954)** "The Upper Panchaganga Basin—A study in the Geomorphology of the Deccan Traps"—Indian Geographical Journal, Vol. XXIX, Nos. 2 and 3.
- DIKSHIT, K. R. (1979)** : "Anomalies in the Distribution of Rainfall on the West Coast of India", Indian Geog., Journal. Vol. 54, No. 1, pp. 1-13.
- DIKSHIT, K. R., RAJGURU, S. N., GHATE, M. S. and JOG, S. R. (1972)** "Some Geomorphological Observations in South Konkan", National Geographical Journal of India. Vol. XVIII, Part-I, pp. 1-17.
- DIKSHIT, K. R. (1976)** : "Geomorphic Features of the West Coast of India between Bombay and Goa"—Geographical Review of India, Vol. 38, No. 3, pp. 260-281.
- (1981)** : "The Western Ghats : A Geomorphic Overview—New perspectives in Geography"—P. Dayal felicitation volume, edited by L. R. Singh, Thinkers Library, Allahabad, pp. 1-25.
- (1976)** : "Drainage Basins of Konkan Forms and Characteristics", National Geog., Journal of India. Vol. XXII, pp. 79-105.
- FERMOR, L. L. (1936 and 1940)** "An Attempt at the Correlation of the Ancient Schistose Formation of Peninsular India"—Mem., G.S.I., Vol. IXX, Part-I, No. 1, Chapter-II, Part-II, Nos. 2, 1940.

- GOVERNMENT OF INDIA,
METEOROLOGICAL
DEPARTMENT** " Climatic Tables of Observatories in India (1931—1960) "
- GUPTA, S. C. (1964)** : " Study of a River Capture in the Upper Koyna Basin "—Bombay Geographical Magazine, Vol. 12, pp. 15-30.
- GUPTA, H. K. and
RASTOGI, B. K. (1974)** " Will Another Damaging Earthquake Occur in Koyna ? ", Nature, Vol. 248, pp. 215-216.
- GUPTA, R. B. (1968)** : " The Koyna Earthquake "—Journal, Geological Society India, Vol. 9, pp. 97-105.
- GOVERNMENT OF INDIA,
MINISTRY OF EDUCATION
AND YOUTH SERVICES
(1972)** " Irrigated Atlas of India "—Report of the Irrigation Commission, Vol. IV, Calcutta.
- GOVERNMENT OF
MAHARASHTRA, NAGPUR
(1968)** " Geology and Mineral Resources of Maharashtra ".
- GOVERNMENT OF INDIA—
INDIA METEOROLOGICAL
DEPARTMENT** " Climatological Tables of Observatories in India—1931-60 ".
- JOG, S. R. and
KARLEKAR, S. N. (1982)** " The Planation Surfaces and the Development of Drainage on Maharashtra Plateau ", Transactions, I.I.G., Vol. 4, Nos. 1, 1982.
- JAMKAR, A. G. and
BHAMRE, S. M. (1983)** " Morphometric Analysis of River Panzara and Its Important Tributaries : A Case Study ", Transactions, I.I.G., Vol. 5, No. 2.
- KSHIRSAGAR, K. P. and
GADGIL, A. S. (1975)** " Climatic Types Based on Moisture Index in Maharashtra "—Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune, 1950-1975.
- KAILASAM, L. N.
MURTHY, B. G. K. and
CHAYANULU, A. V. S. R.,
(1972)** " Regional Studies of the Deccan Trap Areas of Peninsular India "—Current Science, Vol. 41, No. 11, pp. 403-407.
- KALE, V. S. (1983)** : " The India Peninsular Movements, Western Ghat Formation and Their Geomorphic Repercussions ", Transactions, I.I.G., Vol. 5, No. 2.
- KARLEKAR, S. N. (1981)** : " A Geomorphic Study of South Konkan "—(Unpublished Ph. D. Thesis).
- KARMARKAR, B. M. (1978)** : " The Deccan Trap Basalt Flow of the Bhor Ghat Section of Central Railway "—Journal Geological Society India, Vol. 19, pp. 106-114.
- KRISHNASWAMY, S.
(1954)** " The Coasts of India "—The Indian Geographical Journal, Vol. XXIX, No. 1, pp. 29.
- KUMAR, SURENDRA
(1975)** " Stretches of Western Indian Continental Shelf Between Bombay and Goa "—Journal of the Geological Society of India. Vol. XVI, No. 1, pp. 90-93.
- (1975)** : " A Model of the Subsidence History of the West Coast of India "—Tectonophysics, Vol. 27, pp. 167-176.
- MATHUR, L. P., RAO, K. L. N.
and CHAUBE, A. N. (1966)** " Tectonic Framework of Cambay Basin—India ", Bull., O.N.G.C., Vol. V, No. 1, pp. 7-28.
- MISRA, G. K. (1971)** : " Flood Damage Prevention in Maharashtra ", The Deccan Geographer. Vol. IX, No. 2.
- PAWAR C. T. and
SHINDE, S. D. (1979)** " Well Irrigation in Upland Districts of Southern Maharashtra Region—A Spatio-temporal Perspective ", Geographical Review of India, Vol. 41, No. 4.

- PAWAR, K. B., SUKHTANKAR, R. K. PATIL, D. N. and SAWANT, P. T. (1978)** : "Geomorphology and Tectonics of the West Coast of India between Revas and Shrivardhan, Colaba District, Maharashtra"—Tech. Report No. 1, Department of Geology, University of Poona, pp. 64.
- PADHYE, S. S. (1963)** : "Climate of the Deccan Trap Region of Vidarbha"—Indian Geographical Journal, Vol. XXXVIII, Nos. 3 and 4.
- PATIL, R. G. (1976)** : "Rainfall Regions of Western Ghats and the Konkan Coast of Maharashtra"—Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune, 1950-1975.
- POFALI, R. M. (1980)** : "The Geomorphological Features of Nagpur District—Maharashtra", Transactions, I.I.G., Vol. 2, No. 2, 1980.
- POFALI, R. M., HIREKERUR, L. R. and BATTACHARJEE, J. C. (1973)** : "Geomorphological Studies in the Vicinity of Nagpur"—Geographical Review, of India, Vol. XXXV, No. 3, pp. 289-298.
- RADHAKRISHNAN, B. P. (1967)** : "The Western Ghats of the Indian Peninsula", In Proceedings of the Seminar at Sagar 'Geomorphic Studies in India', Ed. W. D. West, SAGAR.
- RAMAN, C. R. V. (1974)** : "Analysis of Commencement of Monsoon Rains Over Maharashtra State for Agricultural Planning"—Pre-Published Science Report, No. 216, IMD, Poona.
- RAMAMURTHY, K. (1970)** : "Rainfall Regimes in India", University of Madras, Madras.
- (1965)** : "Geographical Aspects of Dykes in Dhulia District of Maharashtra", Bombay Geographical Magazine, Vol. XII, No. 1, pp. 81-84.
- SAMBASIVA RAO, A. (1983)** : "Some Agro-Climatic Studies of Maharashtra", Unpublished Ph.D. Thesis, Andhra University, Waltair.
- SUBRAMANIAM, A. R. and SAMBASIVA RAO, A. (1981)** : "Water Balance and Its Applications to Maharashtra", Nt. 1, Geographical Journal India, Vol. XXVII, Parts 3 & 4, pp. 134-145.
- (1984)** : "Agroclimatic Classifications of Maharashtra", Transactions, I.I.G., Vol. 6, No. 1
- SAHASRABUDHE, Y. S. and DESHMUKH, S. S. (1970)** : "Geotectonics of the Deccan Lavas in Western India", Journal of Indian Geophysical Union, Vol. VII.
- SATYANARAYAN (1959)** : "Soil Map of New Bombay State", Bombay Geographical Magazine, Vol. V, No. 1.
- LA TOUCHE (1918)** : "Submerged Forests of Bombay"—Geological Survey of India—Records, Vol. 49, pp. 214-219.
- WENSIL, H and KLOOTWIJIK, C. T. (1971)** : "Palaeomagnetism of the Deccan Trap in the Western Ghats near Poona (India)"—Tectonophysics, Vol. 11, No. 3, pp. 175-190.
- WEST, W. D. (1959)** : "The Source of the Deccan Trap Flows", Journal, Geological Society, India, Vol. 1, pp. 44-48.
- WILKINSON, C. J. (1871)** : "Sketch of the Geological Structure of South Konkan", Rec. Geol. Survey of India, Vol. IV, Pt.-II, pp. 44-48.

BIBLIOGRAPHY—II

MAHARASHTRA—THE PEOPLE AND THE ECONOMY

- AMRITE, V. C. (1965)** : " Land Utilization in Coastal Thane District (N. Konkan) "—Bombay Geographical Magazine. Vol. XIII. No. 1.
- ARUNACHALAM, A. B. (1955)** " Bombay City—Stages of Development ", Vol. III, 34, Bombay Geog., Magazine.
- BHANDARKAR, R. G. (1895)** " Early History of the Deccan "—Calcutta—2nd Edition.
- BANK OF MAHARASHTRA, (1982)** " Socio-Economic and Technical Survey of Konkan Region "—Vols. I, II, III and IV.
- BARVE, S. G. (1952)** : " An Outline of a Master Plan for Greater Poona "—Published by S. G. Barve, Commissioner, P.M.C.
- BHAT, L. S. (1959)** : " Some Aspects of Agriculture in Lower Kumbhi Valley—Kolhapur District ", Vol. IV, pp. 75. Bombay Geographical Magazine.
- BALKRISHNA (1939)** : " Shivaji the Great ", Arya Book Depot, Kolhapur.
- BHAGWAT, A. K. (ed) (1977)** : " Maharashtra—A Profile ", V. S. Khandekar felicitation volume.
- CHOKSEY, R. D. (1960)** : " Economic Life in Bombay Konkan (1818-1939) ", Asia Publishing House, Bombay.
- (1955)** : " Economic Life in the Bombay Deccan ", Asia Publishing House, 34.
- DESHPANDE, C. D. ARUNACHALAM, B. and BHAT, L. S. (1980)** " Impact of a Metropolitan City on the Surrounding Region—A study of South Colaba ", Maharashtra, Concept Publishing Co., New Delhi.
- DESHPANDE, C. D. (1941)** : " Cities and Towns of Bombay Province—Aspects of Urban Geography ", The Indian Geog., Journal. Vol. XVI, No. 3, pp. 284.
- (1976)** : " Trends in Cities and Towns of Western India 1961-71 ", Alam S. Manzoor and Poksheshivsky. V. V. (ed), Urbanization in developing countries, pp. 136, Osmania University Press, Hyderabad.
- (1971)** : " Geography of Maharashtra ", N.B.T. Delhi.
- DATE, V. C. and TECLA D'SOUZA (1966)** " Geography of Foodgrains of Maharashtra ", Bombay Geographical Magazine. Vol. XIV, No. 1, pp. 21-32.
- DATYE, V. S. and GUPTE, S. C. (1979)** " Slope and Agricultural Landuse in Poona District ", Transactions, I.I.G., Col. 1, July 1979.
- (1984)** : " Association between Landuse and Physico-Socio-Economic Phenomena ", Transactions of the Institute of Indian Geographers, Vol. 6, No. 2, pp. 61-72.
- DANDEKAR, V. M. and PETHE, V. R. (1972)** " Survey of Famine Condition in the Drought-affected Regions of Maharashtra and Mysore ".
- DANDEKAR, V. M. (1963)** : " A Survey of Rural Housing in a Deccan Village ", Gokhale Institute of Politics and Economics, Pune.
- DHAVALIKAR, M. K. (1984)** : " Ajanta—A Cultural Study ", University of Poona Publication, Pune.
- DESHMUKH, P. W. and PAWAR, C. T. (1977)** " Occupational Characteristics of New Towns in Maharashtra "—The Deccan Geographer, Vol. XV, No. 1, pp. 235.

- DECCAN SUGAR INSTITUTE, PUNE (1979-80 and 1978-79)** "Working Results of Cooperative Sugar Factories in Maharashtra".
- DASTANE, S. and HARDIKAR, V. (1983)** "Maharashtra—1983", Dastane Ramchandra & Co., Pune.
- DIDDEE, J. and DATYE, V. S. (1981)** "Model of Spatial Structures of Scheduled Caste Exclaves (vis-a-vis the Main Village)", Transactions, I.I.G., Vol. 3, No. 2, July, 1981.
- DIDDEE, JAYAMALA (1985)** "Central places in Western India"—Pune, University of Poona.
- DIKSHIT, JUTTA (1983)** : "Identification of Drought-prone Areas and Prediction of Crop Expectations in Maharashtra", Geog. Review of India, Calcutta, Vol. 45, No. 4, pp. 48-81.
- (1984)** : "An Assessment of the Need for Irrigation a Case Study of Maharashtra"—The Indian Geog., Journal, Vol. 59, No. 2, pp. 214-31.
- DIDDEE J. KEWALARAMANI, G. and DATYE, V. S. (1982)** "Regional Changes of Agricultural Land to Non-agricultural Uses in Bombay-Poona Corridor", Geographical Review of India. Vol. 44, No. 2, 1982.
- DIKSHIT, K. R. and SAWANT S. B. (1968)** "Hinterland of Poona", The National Geog., Journal of India, Vol. XVI.
- DIKSHIT, K. R. (1959)** : "Some Problems of Landuse in the Planning of Greater Bombay", Bombay Geographical Magazine. Vol. VI-VII. No. 1. pp. 65-79.
- DIKSHIT, K. R. (1973)** : "Agricultural Regions of Maharashtra", Geographical Review of India. Vol. XXXV. No. 4, pp. 384-396.
- (1970)** : "Evolution of Cities in Maharashtra : An Analysis in the Phases of Urbanisation", Indian Geog. Journal. Madras, 1970. Vol. XIV, pp. 53-70.
- (1971)** : "Maharashtra Region in India—a Regional Geography"—Ed. R. L. Singh, Varanasi, pp. 730.
- DIXIT, V. G. (1975)** : "Landuse of Konkan—Kolar Doab"—The Deccan Geographer. Vol. XIII, Nos. 1 and 2.
- ENTHOVEN, R. E. (1973)** : "Tribes and Castes of Bombay", Vols. 1, 2 & 3, reprinted Cosmo Publication, Delhi. First Published in 1922.
- GADGIL, D. R. (1945)** : "Poona : A Socio-Economic Survey"—Gokhale Institute of Politics and Economics Publication No. 12.
- (1968)** : "Sholapur City—Socio-Economic Study"—Gokhale Institute of Politics and Economics Study No. 46.
- GADGIL, M. V. (1971)** : "Study of Wateruse under Some Irrigation Tanks in the Bombay Deccan", GIPE, Publication.
- GANANATHAN, V. S. and IYER, B. V. (1963)** "Manufacturing Industries in and around Poona", Indian Geographical Journal. Vol. XXXVII, Nos. 3 and 4.
- (1978)** : "Importance of the Arabian Sea in the Economic and Development of India", The Deccan Geog., Vol. XVI. No. 1.
- (1962)** : "Western Districts of Upland and Maharashtra", Indian Geographical Journal. Vol. XXXVII, No. 4.
- GHURYE, G. S. (1961)** : "Caste, Class and Occupation", Popular Book Depot, Bombay.
- GHOSH, SUPROKASH (1944)** "The Fallacy of the Satpura Mahadeo-Maikal Line as a Major Regional Divide in India", Calcutta Geographical Review, Vol. VI, No. 4, 1944.

- GOVERNMENT OF MAHARASHTRA (1979)** "Regional Plan for Bombay Metropolitan Region—1970-91", Bombay Metropolitan Region, Planning Board.
- (1980) : "Statistical Abstracts of Maharashtra", Directorate of Economics and Statistics.
- (1976) : "Industrial Profile of Maharashtra State".
- (1978-73) : "Draft Five Year Plans (1978-73)", Planning Department, Bombay.
- (1980-81) : "Economic Survey of Maharashtra", Directorate of Economics and Statistics.
- (1980) : "Maharashtra—An Economic Review"—M.E.D.C.
- (1979) : "Energy in Maharashtra in A.D. 2000"—Vol. VII, Monthly Economic Digest Special Number. M.E.D.C.
- GOVERNMENT OF MAHARASHTRA (1978)** "Maharashtra—A guide to Entrepreneurs"—M.E.D.C.
- (1977) : "Growth Centres in Maharashtra", M.E.D.C.
- (1972) : "Maharashtra—Facts, Figures and Opportunities"—M.E.D.C.
- (1970) : "Agro Industries in Maharashtra—Problems and Prospects", M.E.D.C.
- (1975-76) : "Socio-Economic Review and Dist. Statistical Abstracts for All Districts".
- (1980, 1975 and 1969) : "Hand Book of Basic Statistics of Maharashtra State"—Directorate of Economics and Statistics, Bombay.
- (1976) : "Decade of Progress—Maharashtra Public Health"—Directorate General of Information and Public Relations, Bombay.
- GOVERNMENT OF MAHARASHTRA** "Maharashtra 1973-74", Directorate General of Information and Public Relations, Bombay.
- (Variable) : "Gazetteer of India, Maharashtra State", Gazetteers—for all districts. Directorate of Government Printing and Stationery and Publications, Maharashtra State.
- (1976) : "Outline of Activities 1975-76 and 1976-77".
- (1976) : "Decade of Progress—Maharashtra—Agriculture".
- GOVERNMENT OF INDIA, NATIONAL ATLAS AND THEMATIC MAPPING ORGANIZATION, DEPARTMENT OF SCIENCE AND TECHNOLOGY, CALCUTTA, (1980)** "National Atlas of India", Vols. I & II.
- GOVERNMENT OF MAHARASHTRA, FOREST DEPARTMENT (1981)** "Maharashtra Forest : A Statistical Outline".
- (1981) : "Forest Statistics of Maharashtra" (mimeographed) Forest Department.
- GOVERNMENT OF MAHARASHTRA (1979-80)** "Statistical Abstract of Maharashtra and Survey of Maharashtra (1979-80)".
- GOVERNMENT OF MAHARASHTRA (1962) :** "Maharashtra State Irrigation Commission Report", pp. 182.
- GOVERNMENT OF INDIA (1972)** "Report of the Irrigation Commission", Vols. 1-4., New Delhi.

- INDIAN INVESTMENT CENTRE (1976)** "Scope for Industries in Different States—Incentives and Facilities for Industrial Promotion", Industrial Development.
- JAIN, N. G. and IYER, L. (1980)** "Urban Spatial Pattern in Maharashtra",—Deccan Geographer. Vol. XVIII, No. 2.
- JOSHI, C. B. (1956)** : "The Historical Geography of the Island of Bombay", Vol. IV, No. 3, Bombay Geographical Magazine.
- JOSHI, S. N. (1960)** : "Marathe Kalin Samaj Darshan", Anath Vidyarthi Gruha Prakashan, Poona.
- JOSHI, R. V. (1952)** : "Urban Structure in Western India—Poona—A Sample Study", Geog. Review of India, Vol. XIV, No. 1, pp. 7-19.
- JOSHI and ARUNACHALAM (1966)** "Maharashtra—A Regional Study".
- JAIN, N. G. (1975)** : "Retail Shopping Centres of Nagpur West—Landuse and Planning", The Deccan Geographer, Vol. XIII, Nos. 1 and 2, pp. 145.
- JOGALEKAR, S. A. (1952)** : "Sahyadri".
- JOSHI, C. B. (1961)** : "The Ratnagiri Taluka—Landuse and Settlement"—Bombay Geographical Magazine, Vols. VIII-IX. pp. 5-19.
- KARVE, I. (1951)** : *Marathi Lokanchi Sanskrit*. Pune.
- KARVE, I. (1968)** : "Maharashtra : Land and Its People", Maharashtra State Gazetteers, General Series No. 10. Govt. of Maharashtra, Bombay.
- (1968)** : "Bhils of West Khandesh", Anthropological Society of Bombay, Bombay.
- (1948)** : "Anthropometric Measurements of Marathas", Deccan College Monograph Series No. 2.
- KARVE, I. and DANDEKAR, V. M. (1951)** "Anthropometric Measurement of Maharashtra"—Deccan College Monograph Series No. 8.
- KULKARNI, A. R. (1969)** : "Maharashtra in the Age of Shivaji"—R. J. Deshmukh and Co., Pune.
- KULKARNI, D. G. ()** : "River Basins of Maharashtra", Orient Longman.
- KINCAID, C. A. (1925)** : "A History of the Maratha People—3 Volumes"—Humphrey Milford-Oxford University Press.
- KHARBAS, D. S. (1975)** : "Maharashtra and the Marathas, Their History and Culture—A Bibliographic Guide to Western Languages Material, Boston Mass.
- KARANDIKAR, S. L. (1969)** : "The Rise and Fall of the Maratha Power", Sitabai S. Karandikar, Pune.
- KHATU, K. K. (1970)** : "Konkan—A Case for Development Research"—The Deccan Geographer. Vol. XVII, No. 2.
- KHANDWE, M. A. (1982)** : "Distribution Pattern and Classification of Market Centres in Amravati District", Deccan Geographer, Vol. XX, No. 2.
- KULKARNI, G. S. (1961)** : "Industrial Landuse of Greater Poona", Bombay Geographical Magazine, Vol. VIII-IX, pp. 85-94.
- KARVE, C. G. and JOGALEKAR, S. A. (1954)** "Maharashtra Parichaya".
- MAHARASHTRA ECONOMIC DEVELOPMENT COUNCIL, BOMBAY (1967)** "Maharashtra—An Economic Review".

- MATE, M. S. (1962)** : "Temples and Legends of Maharashtra", Bharatiya Vidya Bhavan, Bombay.
- MULAY, SUMATI (1972)** : "Studies in Historical and Cultural Geography and Ethnography of the Deccan" (Ph.D. Thesis).
- MALSHE, P. T. and PATHAK, A. N. (1979)** "The Study of Immediate Upland of Dhule and Jalgaon"—The Deccan Geographers, Vol. XVII, No. 2, pp. 615.
- MALSHE, P. T. (1974)** : "Kolhapur : A Study in Urban Geography", University of Poona, Pune.
- (1976)** : "Satara—An Urban Survey", Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune. 1950-1975.
- MATHURE, R. R. (1966)** : "Thana—A Study in Urban Landscape"—Bombay Geographical Magazine, Vol. XIV, No. 1, pp. 60-65.
- MAHRATTA INDUSTRIAL ANNUAL (1980)** "Kesari Mahratta Trust Publication".
- MEHER HOMJI, V. M. (1967)** "Vegetation of Peninsular India and Its Cartography".
- MUKHERJEE, SUDERSHAN (1967)** "Agricultural Production in Vidarbha"—The Deccan Geographer, Vol. V, Nos. 1 & 2.
- NADKARNI, R. V. (1966)** : "The Rise and Fall of Maratha Empire", Popular Prakashan, Bombay.
- NIGEL HARRIS (1978)** : "Economic Development, Cities and Planning—The Core of Bombay".
- NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH (1963)** "Techno Economic Survey of Maharashtra", NCAER, New Delhi.
- ODILIA COUTINHO and RAMAMURTHY, K. (1972)** "A Study of Rural Settlement Patterns in Maharashtra", Vol. XLVII, Nos. 1 and 2, Indian Geog., Journal.
- PARASNIS, D. B. (1921)** : "Poona in Bygone Days"—Time Press, Bombay.
- PATIL, R. G. (1980)** : "Plant Geography of Western Ghats in Maharashtra" (Unpublished Ph.D. thesis), University of Poona.
- PATWARDHAN, S. (1965)** : "A Study of the Scheduled Castes in an Urban Setting", Ph.D. thesis, University of Poona.
- QURESHI, I. M. (1962)** : "Forest Flora of Maharashtra State"—Maharashtra State Forest Centenary Souvenir, Poona, pp. 120-28.
- ROY, B. C. (1961)** : "Mineral Resources of Maharashtra—Proceedings of the Maharashtra Mineral Industries, Bombay", Organized by the Maratha Chamber of Commerce.
- RAMAMURTHY, K. (1970)** : "Rainfall Regimes in India"—University of Madras.
- RAYCHAUDHURI, S. P., et al (1963)** "Soils of India"—Indian Council of Agricultural Research, New Delhi.
- RAO, K. L. (1975)** : "India's Water Wealth : Its Assessment, Uses and Projections", Orient Longman.
- RAMAMURTHY, K. and SHINDE, S. S. (1976)** "State Transport Bus Services—A Geographical Study", Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune. 1950-1975.

- SARDESAI, G. S. (1946 and 1948)** "New History of the Marathas, 3 Volumes", Phoenix Publications, Bombay.
- SETU MADHAV RAO PAGADI (1974)** "Chhatrapati Shivaji"—Continental Prakashan, Pune.
- SURENDRA NATH (1920)** : "Siva Chhatrapati", K. P. Bagchi and Co., Calcutta.
- SARKAR JADUNATH (1952)** "Shivaji and His Times"—Calcutta, 5th edition, Orient Longman.
- SOVANI, N. V.** : "Social Survey of Kolhapur City"—G.I.P.E.
- SANKALIA, H. D. (1974)** : "Pre-history and Protohistory of India and Pakistan", Special Publication of Deccan College Post Graduate and Research Institute, Pune.
- SINGH GOVIND SARAN (1964)** "British Enclaves and the Reorganization of the Maharashtra State"—The Deccan Geographer. Vol. II, No. 2, pp. 146.
- SURENDRA GOPAL (1971)** : "Coastal Trade between Gujarat and Maharashtra in 16th Century—Maratha History", Seminar, Shivaji University, Kolhapur.
- SAWANT, S. B. and NALOLE, G. B. (1977)** "A Study of Functional Bases of Cities in Maharashtra", Geog., Review of India, Vol. IXI, No. 2, pp. 89-96.
- SAWANT, S. B. (1979)** : "Trend of Rural Transformation in Pune District"—The Deccan Geog., Vol. XVII, No. 2.
- SAWANT, S. B. and KHAN, Y. S. (1982)** "Some Factors Influencing Variations in the Rate of Natural Increase of Population in Western Maharashtra", Population Geography, Vol. 4, No. 182.
- SAWANT, S. B. and NALOLE, G. B. (1977)** "Rural Planning in Western Maharashtra"—The Deccan Geog., Vol. XV, No. 2.
- SITA, K. (1980)** : "Some Aspects of Urbanization in South Konkan"—Geog., Review of India, Vol. XLII, No. 3, pp. 238.
- SHINDE, S. D. (1974)** : "Konkan", Indian Geographical Journal, Vol. XLIV, No. 2, pp. 61.
- SAKHALKAR, S. B. (1980)** : "Recent Trends in the Economy of Maharashtra", Mahratta Industrial Annual, Kesari Mahratta Trust Publication.
- SHINDE, S. (1973)** : "The Panchganga Basin : An Appraisal of Some Aspects of Its Agricultural Geography", Geographical Review of India, Vol. XXXV, Nos. 3, pp. 263-276.
- SHINDE, S. D. and JADHAV, M. G. (1978)** "Use of Energy in Agriculture in Sangli District—A Geographical Analysis", Geographical Review of India, Vol. 40, No. 2.
- (1973)** : "Konkan : Horticultural Resources and Potential", The Deccan Geographer, Vol. XI, Nos. 1 and 2, pp. 75.
- (1976)** : "Use of Agricultural Implements and Machinery in Konkan : A Geographical Analysis", Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune, 1950-1975.
- SINGH, R. P. (1975)** : "Landuse and Planning of Nagpur"—The Deccan Geographer. Vol. XIII, Nos. 1 and 2.
- TILEKAR, S. R. (1966)** : "Maharashtra—The Lands, Its People, and Their Culture", Maharashtra Information Centre, New Delhi.
- TAMASKAR, B. C. (1968)** : "Human Dwellings and Related Cultural Features on the Maha-Siva-Purna", Bombay Geog., Magazine, Vol. XVI, No. 1, pp. 39-46.
- TAWADE, M. D. and SAWANT, G. B. (1974)** "The Changing Hierarchies of the Ports of Maharashtra"—National Geographical Journal of India., Vol. XV, Part-I.
- TAWADE, M. D. and HARDIKAR, R. N. (1976)** "Functional Status of Periodic Rural Markets in South Konkan", Silver Jubilee Souvenir, Department of Geography, University of Poona, Pune, 1950-1975.

- VARMA, K. M. (1953)** : " Orange Cultivation in Vidarbha "—The Deccan Geographer., Vol. II, No. 1.
- WANMALI SUDHIR (1983)** : " Service Provision, Special Intervention and Settlements Systems : The Case of Nagpur Metropolitan Region, India "—Annals of the National Association of Geographer, India, Vol. III, No. 2.
- (1970)** : " Regional Planning for Social Facilities : An Examination of Central Place Concepts and Their Application : A Case Study of Eastern Maharashtra ", National Institute of Community Development, Hyderabad.
- WAGH, D. M. (1981)** : " Agricultural Planning : A Micro-level Approach with Reference to Maval Taluka, Pune District "—I.C.S.S.R. Project (Mimeographed).

□ □

INDEX

A

Aboriginal Tribes, 109
 Abu, 6
 Adilshahi, 1, 142
 Ahmednagar, 1, **171**
 Ahmednagar plateau, 170
 Ahmedshah, 171
 Agricultural production, 59
 Ajanta Caves, 181, 182
 Ajanta plateau range, 24, **180**
 Akluj, 179
 Akhrani hills, 184
 Akola, 5, **186**
 Alibagh, 159
 Allapalli teak, 193
 Amaravati, 7, **186**
 Ambedkar, B. R., 108, 131, 181
 Ambernath, 203
 Andhs, 109, 113
Aparantaka, 141
 Arvi, 187
 Archaeology, 12
 Archaeans, 16, 20
 Aurangabad, 1, 7, **171**
 Aurangzeb, 2

B

Badami, 1
 Bahmanis, 1, 142
 Bajirao-I, 2
 Balaji Vishwanath, 2
Baluta, 140
Balutedars, 106, 140
 Basalt plateau, 16
Bagait land, 60
 Baroda, 51
 Baramati, 173
 Bauxite, 20
 Belapur, 203
 Belgaum, 5, 7
 Berar, 1, 186
 Betul, 187
 Bhandara, 7, 20, **192**
 Bhir, 7
 Bhadane, 12
 Bhils, 109, **112**
 Bhima river, 12, 172
 Bhimashankar, 165
 Bhosales, 188
 Bhusawal, 184
 Bidar, 1
 Bijapur, 1, 2, 7
Bhudki mot, 175
 Bombay, 7
 Bombay State, 6
 Bombay Greater, 196
 Bombay Metropolitan region, 196
 Bombay port, 202
 Bombay Suburbs, 197, 202

Bombay Industries, 202, 203
 Bombay (New), 203
 Bombay Demographic Characteristics, 240
 Bombay, Problems, 205
 Bombay, city region, 205
 Bombay High, 53, 203
 Borivli, 12, 14
 Brahmins, 104, 107, 142
 Brahmins, Deshasthas, 106
 Brahmins-Chitpavan, 104
 Brahmपुरi, 15
 Buldana, 7
 Buddhism, 104, 108, 131
 Buttes, 17

C

Caves, 14
 Calcium, 19
 Chalukyas, 1, 15, 141
 Chandrapur, 7, 190, **191**
 Chandoli, 14
Chambhar, 104, 108
Chawls, 197
 Chalcolithic culture, 14
 Chikhli, 15
 Chikhhalda, 25, 185
 Chemical Industry, 89
 Chirki, 12
 Chhatrapatis, 2, 177
 Cholas, 1
 Christianity, 104
 Coal, 190
 Copper, 20
 Coastal plain, 21
 Coast line, 21
 Coastal shipping, 102
 Crop pattern, 57
 Cuddappah, 16
 Culturable Waste, 56

D

Dangs, 6
Dalit panthers, 108
Dakhinabad, 141
 Daultabad, 1, 15, **141**
 Deccan, 1, 21
 Deccan trap, 16, 20, 186
 Delhi, 2
 Deogiri, 15, 104
 Deoni breed, 171
Devaks, 106
Dhangars, 113, 159, 171
 Dharavi, 196
 Dharwar, (s) 7, 16, 19
 Dhule (Dhulia), 12, **183**
Dindi, 178
 Dnyanganga, 186
 Dnyaneshwar, 178
 Dolomite, 19

Dravidian, 104
 Dykes, 16

E

East India Co., 196
 Eastern Hills, 195
 Effusion of lava, 16
 Ellora, 181, 182
 Engineering Industry, 88
 Escarpment (Western Ghats), 21
 Estuarine plain, 38
 Evapotranspiration, 36

F

Farming Communities, 65
 Fault, 16
 Fault Scarp, 25
 Fissures, 16
 Forest-types, 44, 185
 Evergreen, 44
 Sub-tropical, 44
 Deciduous, 46
 Mangrove, 46
 Forest parks, 51
 FORT, Bombay, 197
 Fort-towns, 143
 Fossils, 12

G

Gadchiroli, 193
Gadhis, 139
 Gavilgad, 185
 Girna river, 183
 Godavari, 12, 15, 167
 Gonds, 109, **112**, 113, 191, 192, 193, 195
 Gondi, 194
 Gondland, 190
 Gondia, 192
 Gond king, 193
 Gondwana, 16, 17
 Gohilwad, 6
 Gujarat, 6
 Gujarati, 7
 Guru Govind Singh, 180

H

Habshis, 104
Halba, 113
 Hasan Gangu, 1
 Hamlets, 137
 Handlooms, 178
 Hematite ore, 19
Hirda, 50
 Historic sites, 15
 Hindus, 1, 131
 Hyderabad, 6, 7

- I**
- Imadshahi*, 1
Industrialization, 142
Industries, 150, 162, 170
Indo-Aryans, 104
Inamgaon, 14, 15
Innovation (Agriculture), 65
Interfluves, 24
Iron ore, 195
Irrigation projects, 75
- J**
- Jagirdars, 1, 5
Jalgaon, 184
Jalna, 182
Jayakwadi, 179
Jejuri, 113, 174
Jirayat farming, 60, 65, 138
Jorwe Culture, 8
- K**
- Kalchuris, 1
Kalas, 15
Kaladgis, 16, 20
Kalsubai, 21
Karad, 1
Karachi, 5
Karnatak, 2, 5, 7, 19
Kathiawad, 5
Kathkaris, 109, 157
Kamthi, 20
Kandivli, 12, 14
Kalyan, 15
Kayasthas, 104
Kerala, 5
Khandoba, 113
Khuldabad, 182
Kolhapur, 6, 15, 176
Konkan, 14, 16, 21, 153
Konkan Streams, 29
Konkan Development, 163
Kondana, 172
Korkus, 109, 113, 185
Krishna, 12, 27, 175
Kunbis, 104, 106, 186
Kurundwad, 15
Kumri, 44
Kumbhar, 104, 107
Kuls, 106
Kulvadis, 106
Kshatrapas, 141
- L**
- Lac, 194
Lava, 16
Lalmahal, 172
Landuse, 52
Laterites, 17, 20, 21, 44, 162
Latur, 181
Leaching, 38
Leva-patidars, 183
Limestone, 19
- Lonavla, 166
Lunar Crater, 180
- M**
- Madhmeshwar, 12
Mahad, 2
Mahikantha, 5
Mahabaleshwar, 17, 164, 166
Maharashtra, Organization, 5
Maharashtra, Changing Map, 5
Maharashtra, Present State, 7
Maharashtra, Pre & Protohistory, 12
Maharashtra, Geology and Minerals, 16
Maharashtra, Relief, 22
Maharashtra, Plateau, 24
Maharashtra, Drainage, 26
Maharashtra, Temp. Conditions, 31
Maharashtra, Rainfall, 32
Maharashtra, Water-budget, 36
Maharashtra, Soils, 39
Maharashtra, Forests, 43
Maharashtra, Landuse and Agriculture, 53
Maharashtra, Irrigation, 67
Maharashtra, Power Resources, 80
Maharashtra, Industries, 85
Maharashtra, Transport-Trade, 94
Maharashtra, People, 104
Maharashtra, Population, 118
Maharashtra, Regions, 152
Malkhed, 15
Mahar, 108, 131
Mang, 104, 108
Manganese, 20, 192, 195
Malas, 60
Malguzars, 70
Malek Amber, 182
Marathas, 1, 2, 5, 104
Marathi, 7, 113, 116
M. P., 7
Matheran, 17
Maval, 13, 37, 166, 167
Mehsana, 6
Medieval Routes, 94
Melghat, 113, 185
Mesolithic Culture, 12
Metropolitan, Agglomeration, 119
Minerals, 17, 20, 162
Microliths, 14
Momins, 188
Mughals, 1
Muslims, 1, 2, 104, 131, 143
- N**
- Nachani*, 166
Nagpur, 7, 20, 188
Nanded, 7, 180
Nashik, 15, 169
Nhava-Sheva, 203
Nevasa, 12, 14, 15
Narsobawadi, 177
Natural Gas, 77
Navdatoli, 14
Neolithic Culture, 12, 14
Nira River, 174
- Nizamshahi, 1, 141, 142
Nomadic Tribes, 113
North Kanara, 7
- O**
- Osmanabad, 7, 171
Osari, 138
Ozar, 169
- P**
- Padvi*, 138
Panipat, 2, 5
Paithan, 1, 15, 169
Palaeozoic, 16
Palaeolithic, 12, 14
Panchgani, 17
Panchvati, 169
Pandharpur, 151, 172, 178
Panvel, 203
Parbhani, 7
Pardhis, 113
Parsis, 104, 166
Parks, 52
Patil (s), 138
Patne Culture, 14
Pavnar, 188
Peninsular Shield, 16
Petenikas, 141
Periplus, 141
Peaks and Passes, 164
Pediments, 24
Peshwas, 2, 5, 107, 172
Pravara, 6
Prakash Culture, 14, 184
Prabhush, 104
Portuguese, 104
Ports, 141
Pottery, 191
Population Composition, 119
Powadas, 177
Power, 165
Pune (Poona), 2, 12, 14, 172, 173, 174
Punjab, 5
Purna Plain, 186
- Q**
- Quartzite, 16
- R**
- Rab*, 47
Radhanpur, 6
Raigad, 2
Railways, 99
Rajaram, 2
Rajasthan, 5, 6
Rajgonds, 194
Raj Pramukh, 5, 6
Rashtrakutas, 1, 15, 141
Rayats, 106
Ramlinganghat, 171
Ramtek, 193
Ratnagiri, 162

Ringni Jowar, 190
 Religions, 131
 Reorganization of States, 5
 Road Network, 96
 Routes, Traditional, 94
 Rural Settlements, 134

S

Sabarkantha, 6
 Sahar Airport, 197
 Sahyadris, 164
 Sanctuaries, 51
 Sambhaji, 2
 Salsette Island, 197
 Santacruz, 197
 Sandstone, 16
 Saswad, 174
 Satara, 2, 6, 175, 176
 Satpudas, 184
 Saurashtra, 5, 6, 7
 Scheduled Castes, 140, 181
 Satvahnas, 1, 15, 141
 Sind, 5, 6
 Sinhgad, 172
 Sironcha, 193
 Shirdi, 170
 Shivaji, 1, 2
 Sholapur, 184
 Shifting Cultivation, 47
 Silica, 16
 Sopara, 15, 141
 Solonet, 16
Swarajya, 2
 Sangli, 176
 Sawantwadi, 162

T

Talathi, 138
Tassar, 190
 Tamilnadu, 2
 Tapi, 12, 182, 190
 Telugu, 116
 Textiles, 104, 178
Tendu Leaves, 192, 194
 Thal Waishet, 203
 Thane, 204
 Thermal Power, 85
 Tilak, 2
Tukum, 191
 Tumsar, 192
 Towns, 141, 143
 Trade, 103
 Trombay, 203
 Transhumance, 113
 Trans-Thane Belt, 204
 Trimbakeshwar, 169
 Twin City (Bombay), 204
 Typology of Tools, 12

U

Urban Agglomeration, 148, 150, 204
 Urban Belt, 149
 Urban Clusters, 149
 Uran, 203
 Urbanization, 142, 143

V

Varkas land, 47
Varhadi, 186
Varkari, 179

Vatan, 140
Vatandar, 140
 Vedic, 107, 141
 Vidarbha, 12
 Vijayanagar, 1, 6
 Villages, 133, 137
 Village Diffusion, 139
 Vindhayns, 16
 Vithoba, 113, 151
 Volcanoes, 16

W

Wadis, 139
Wadas, 174
 Wainganga Plain, 191
 Wardha-Wainganga, 12, 186
 Wardha, 7, 188
 Warangal, 1
 Warli, 109, 118
 Water-Transport, 102
 West-coast, 5
 Western Ghats, 22, 32, 164
 Wild Life, 165
 Wild Sanctuaries, 51

Y

Yadavas, 1, 15, 104
 Yavatmal, 113

Z

Zalawad, 6
 Zoroastrianism, 104
 Zamindari, 193, 194

□ □



