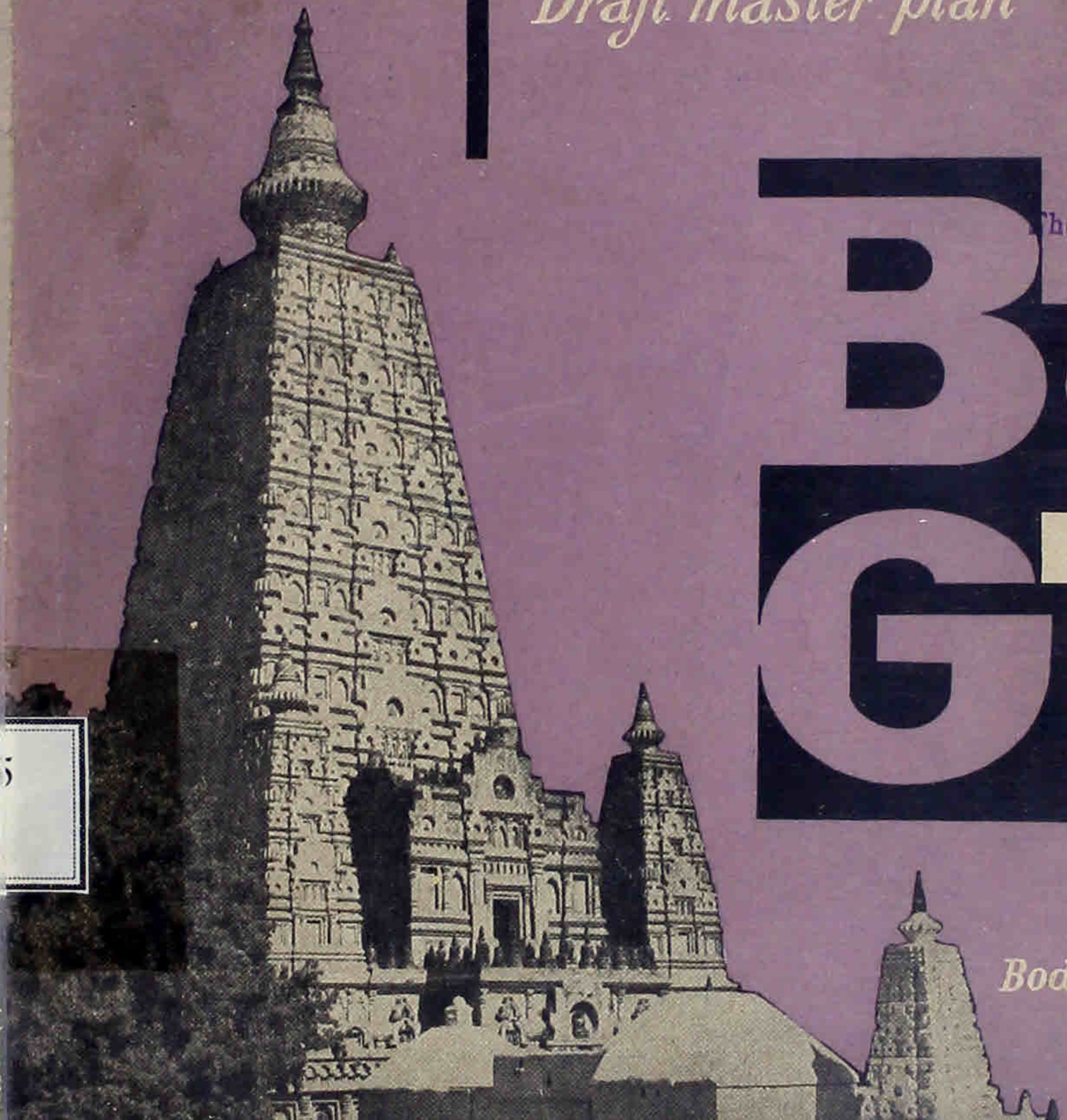
Draft master plan

Bodh Gaya



Bodh-Gaya Town Planning Authority

PREPARED BY THE TOWN PLANNING ORGANISATION, L.S.-G. DEPT.
BIHAR, FOR THE BODH GAYA TOWN PLANNING AUTHORITY

MESSAGE :

Bodh Gaya has special historical significance for us and for Buddhists the world over for whom it is a place of pilgrimage. It is, therefore, important to see that this city does not develop haphazardly but according to a well thought out plan which gives consideration to the needs and conveniences of the local population as well as of tourists and pilgrims.

I hope, the Master Plan for the development of Bodh Gaya will blend reverence with beauty and will indicate how greatly India values this ancient site of Buddha's enlightenment.

Prime Minister of India

18-3-1966

Indira Gandhi

Chief Minister, Bihar

MESSAGE :

Lord Buddha attained Supreme Enlightenment at Bodh Gaya. The town, therefore, stands as a symbol not only of the richness of India's past but also of one of the greatest heritages of mankind. Our troubled world today needs, as never before, a renewed dedication to the sublime teachings of the Buddha. Bodh Gaya has a very special significance as the place most hallowed by the Lord Buddha himself.

The Draft Master Plan framed for the development of Bodh Gaya into a garden sanctuary, blending as it does reverence with beauty, should, when implemented, be able to provide an environment worthy of our humble tribute to the great vision of the Great Master. Bihar is grateful to the people and the Governments of many countries for their abiding interest in the development of Bodh Gaya.

16-9-1966 K. B. SAHAY

Minister, L. S.-G. (Town Planning), Bihar

MESSAGE :

Bodh Gaya is a small town in Bihar but historically the most important. It was here, under the hoary Bodh tree that Gautama, the one time Prince, attained 'Samya Sambodhi' and became Buddha the Enlightened One. It was again from here that His spiritual emissaries went out to the wide world to spread His abiding message of love and peace. Bodh Gaya is not only a craddle of Buddhism, and the holiest of the holy places associated with the life of the Buddha; it is a beacon of hope of love and peace between man and man in the present-day world of basic conflicts.

Therefore, besides just providing the material necessities of an urban community, the development of Bodh Gaya also calls for creating an environment which can attune man to the nobler aspects of life. I am glad that a Draft Master Plan of Bodh Gaya has now been prepared, with this as the central objective.

14-9-1966 S. N. SINHA

FOREWORD

The Draft Master Plan for Bodh Gaya prepared under the provisions of the Bihar Town Planning and Improvement Trust Act has received help and co-operation from a large number of persons and institutions. The studies for preparation of it were undertaken by the Town Planning Organisation, Local Self-Government Department, Bihar, in December, 1962. The draft proposals now presented were completed in 1964, though it could not be published earlier. The Bodh Gaya Town Planning Authority was created in March, 1966, which undertook the publication of the Draft Master Plan and will also implement it in stages.

The necessity for preparing a Master Plan for this historic town has long been recognised. There has been a demand for provision of facilities not only for its local population but also for the hundreds and thousands of visitors, pilgrims and tourists who visit the town from all over the world every year. In recent years there has been a great demand for developed plots at Bodh Gaya from the Buddhist countries for setting up monasteries around the sacred Bodhi Temple. Necessary provision for this has been made in the Plan, which also provides for various other necessities for the permanent urban community at Bodh Gaya as also for the visitors from the Buddhist world and other places.

This Draft Master Plan gives proposals only in broad outline for the future development of the town. As provided in the Bihar Town Planning and Improvement Trust Act, objections and suggestions to these proposals, if any, have been invited. These will be fully examined by the Town Planning Authority and after incorporating necessary changes, the Draft Plan will be submitted to Government for adoption.

The task of pushing the work and co-ordinating the different points in view, has fallen on me and I find it as rewarding as it is challenging. It is appropriate that the maintenance of this hallowed land should indicate the right psychological address in the many Buddhist and non-Buddhist alike, that look to the Buddha for guidance.

All are welcome to contribute to the Plan in any manner they choose.

H. N. THAKUR
Commissioner, Patna Division

PREFACE

Enlightenment came to Gautama under the Sacred Tree at Bodh Gaya, and from there the Message spread far and wide, to lands beyond the seas. The children of those lands have, in past centuries, come as pilgrims to Bodh Gaya, to nourish their faith at its very fountain-source. Now free India extends her welcome to those pilgrims to come in larger numbers, to stay and to derive solace.

The Mahabodhi Temple dominates Bodh Gaya, and is its very life. Bodh Gaya can develop only as the Place of the Temple : and trade and industry can be allowed only so far as they strengthen its base. This is the guiding principle of the present Draft Plan.

The State Town Planning Department's Project Team, under Shri J. C. P. Sinha, Assistant Town Planner, has laboured enthusiastically to prepare this Plan. It is hoped that the Members of the Bodh Gaya Temple Advisory Board, who are giving their valuable time to the consideration of the Plan, will continue to guide and assist, so that this Plan may be improved and implemented in a manner worthy of the high spiritual values which it commemorates.

V. BALASUBRAHMANYAN
Secretary to Government

PATNA :
The 15th September, 1966

BODH GAYA TEMPLE ADVISORY BOARD

(1) Shri Wunna Kyaw Htin Bamaung of Burma.

(2) Shri U Ba Set of Burma.

(3) Sir Richard Aluwihare of Ceylon.

(4) Shri Nalin Moone Singhe of Ceylon.

(5) Dr. Koto Matsudaira of Japan.

(6) H. E. Shri Sisouk Na Champassak or in his absence, Shri Platthana Chounramany of Laos.

(7) Shri Asha Rama Sakya of Nepal.

(8) Shri T. S. Gyaltsen of Sikkim.

(9) Rani Chuni Dorji of Bhutan.

(10) The Ambassador of Thailand in India or in his absence, The Charge d'Affairs of the Embassy.

(11) Venerable Va Yav of Cambodia.

(12) Shri Kushak Bakhula.

(13) Shrimati Lakshmi N. Menon.

(14) Shri T. Wang Di.

(15) Shri N. C. Barua.

(16) Kumar Ganganand Singh, M. L. C.

(17) Shri Bhola Paswan, M. L. A.

(18) Shri Brij Kishore Singh, M. P.

(19) Shri Mohan Lal Mahto "Viyogi", M. L. C.

(20) Commonwealth Secretary to the Government of India, Ministry of External Affairs—*Ex-officio.*

(21) Director-General of Archaeology in India—*Ex-officio.*

(22) Commissioner, Patna Division—*Ex-officio Member-Secretary.*

(23) Chairman of the Bodh Gaya Temple Management Committee—*Ex-officio.*

(24) Shri S. V. Sohoni, Food Commissioner, Bihar.

PERSONNEL ASSOCIATED WITH THE PLAN.

BODH GAYA TOWN PLANNING AUTHORITY

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Shri L. G. Choudhari, Town Planner, Bihar.

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Shri K. L. Deo, Architectural Draftsman.

Shri K. M. Abraham, Overseer.

Shri P. K. R. Nair, Overseer.

Shri V. E. Thomas, Overseer.

Shri S. K. Sharma, Survey Assistant.

Shri Ranjit Singh, Tracer.

Shri Mohamad Jamil, Tracer.

PRESENTATION DRAWINGS

Shri O. P. Singh, Junior Town Planner.

Shri Ram Yatan Prasad, Architectural Draftsman.

Shri Jamuna Jha, Draftsman Grade I.

Shri Z. Ahmad, Chairman, Gaya Improvement Trust.

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PREAMBLE

Certain places are remarkable for what they are, others for what they do. This may be said to sum up the distinction between a small but richly historic town like Bodh Gaya and other urban centres. The significance of the former lies in its nature and attributes, of the latter in their products and functions. Among the numerous places, sanctified by their association with the Buddha, it shines the brightest as the seat of his Nirvana.

Location

Bodh Gaya is situated on the western bank of the Niranjana river, about three miles upstream of its confluence with the Mohane, in the headquarter subdivision of the Gaya district of the State of Bihar in India. The combined stream, known as the Falgu, flows past the large district headquarter and pilgrim town of Gaya, about seven miles to the north. This distance, however, separates the centres of the two towns while their administrative boundaries, lying only three and a half miles apart, are spanned by an almost continuous ribbon development along the riverside road.

With the exception of the Grand Trunk Road, a major national highway linking Calcutta and Delhi, other rail and road arteries of traffic converge on the town of Gaya which is, thus, the principal gateway to Bodh Gaya. The former runs twenty miles to the south of Gaya and is linked to it by the Gaya-Dobhi Road. A short approach road of two miles, taking off near the eighth mile of the latter, provides an alternative and better access to Bodh Gaya.

The nearest aerodrome, served by the Indian Airlines Corporation, is at Patna, the State capital about seventy miles to the north by rail. A big civil aviation aerodrome, situated five miles away, can however be used by non-scheduled flights.

Planning Imperatives

The imperatives, which govern the planning of Bodh Gaya, are—

(*a*) Preservation of its supremely important historical, cultural and archaeological background.

(*b*) The necessity of channellising physical and economic development in a manner that highlights the dominance of nature and spirit and does not either compromise or obscure the basic character of the town.

(*c*) The crucial importance of its retention as a small town for then, as Sir Patrick Abercrombie—a noted town planner—puts it, in case of Warwick "its amenities and attributes are more readily grasped and assimilated".

The Plan-Frame

The plan-frame, evolved in the context of the above imperatives, is delineated below :—

(*a*) The preservation of the Maha Bodhi Temple Vista from the approach road.

(*b*) The enhancement of serenity and aesthetic beauty within the Temple sector and generally within the whole town.

(*c*) Convenience of access to sites hallowed by the Lord during his meditations in Uruvilva Vana.

(*d*) Needs of tourist homes, camping grounds, monasteries and rest-houses, meditation, recreational and symbolic parks, etc.

(*e*) Preservation of archaeological areas for excavation.

(*f*) Needs of the resident local population.

(*g*) Local-regional needs due to the town's function as a service-centre and the seat of rural block administration.

(*h*) The needs of the recently established Magadh University.

Development Plan

Obviously, at this holy land of rich and noble memories, technology must subserve higher ends, and, imbibing the spirit of its renaissance, recreate the old glory in its new setting. The Master Plan, worked round the above plan-frame at an envisaged outlay of Rs. 1.80 crores till 1986, naturally keeps this constantly in mind, as also the desire of Buddhists and others—at the government, organisational and individual levels—all over the world to assist and participate in the inspiring adventure of the fullest development of Bodh Gaya. The personality and teachings have, indeed, such a sublime and enchanting quality that, as Christmas Humpheys states in "Buddhism", the Buddha's influence has a universal character and cannot be measured by the number of his declared adherents alone.

THE GEOGRAPHICAL BACKGROUND

Location

1.1. Bodh Gaya, situated on the western bank of the Nilajan (ancient Niranjana) river about three miles upstream of its confluence with the Mohane, lies in the headquarter subdivision of the Gaya district of the State of Bihar in India. The combined stream, known as the Falgu, flows past the large district headquarter and pilgrim town of Gaya, about seven miles to the north. This distance, however, separates the centres of the two towns while their administrative boundaries, lying only three and a half miles apart, are spanned by an almost continuous ribbon development along the riverside road.

1.2. With the exception of the Grand Trunk Road, a major national highway linking Calcutta and Delhi, other rail and road arteries of traffic converge to the town of Gaya which is, thus, the principal gateway to Bodh Gaya. The former runs twenty miles to the south of Gaya and is linked to it by the Gaya-Dobhi Road. A short approach road of two miles, taking off near the eighth mile of the latter, provides an alternative and better (due to the congestion along the riverside road) access to Bodh Gaya.

1.3. The nearest aerodrome, served by the Indian Airlines Corporation, is at Patna, the State capital about seventy miles to the north by rail and road. However, a big civil aviation aerodrome, situated five miles away, can be used by non-scheduled flights.

Topography and Landscape

1.4. Bodh Gaya stands almost at the edge of the transit-region, where the uplands of the Chotanagpur plateau merge into the alluvial southern Gangetic plains. The overall slope of land is from south to north, fixing accordingly the alignment of the outfall sewer and location of the sewage disposal works. The topography is, however, locally modified due to two prongs jutting out from the ridge land behind; one runs along the river and tapers off into the almost flat land (excluding the artificial elevation of the Temple area and the depression of an old moat round it) of the riverside; the other follows the Dobhi Road and introduces a cross-fall towards the east. The catchment between these two prongs is principally drained off by a long channel running from south to north, skirting the Temple precincts on the west.

1.5. Some small scattered hamlets and recent development apart, Bodh Gaya has grown between the above drainage channel and the river within a rectangular area, one and three-quarters of a mile long and half a mile across, in which eighty per cent of the total population resides. Even within this area, the town has grown, with the exception of the Temple precincts and the small hamlet of Tikabigha to the south, about a quarter mile away from the Nilajan—a torrent with wide but shallow bed. The river front thus still remains, on the whole, beautifully wooded, but outside it the

landscape is nearly barren of trees due to cultivation and other land uses.

1.6. In planning terminology, we can divide the above area into the Temple, the northern, the southern and river-front sectors; their detailed study can be conveniently deferred to later sections of the report. West of the Temple sector and the drainage channel skirting it, continuous development reaches up to a mile from the river and is divided by the access artery from the Gaya-Dobhi Road and the trans-regional high tension electricity line. South of the access artery lie the hamlets of Mastipur and Pipal Pati, the recent Thai monastery and State-sponsored development forming the south-western sector. The north-western sector, to the north of the access artery, covers the Miabigha, hamlet, the high school in a ribbon of land, the State seed multiplication farm and the remote hamlets of Janpur, Bhagwanpur, Baijubigha and Bhum Toli. The western sector is presently insignificant with a tiny growth called Domohani standing at the junction of the access artery with the Gaya-Dobhi Road, but would become prominent with the establishment of the Magadha University in the immediate future. The State Agricultural, sheep breeding and poultry farms, as also the agricultural school, lie about one and a half miles and the aerodrome about three miles away from the above junction, towards the town of Gaya eight miles to the north.

1.7. Excluding the Temple sector, with its artificial elevation, town development lies between 395 ± 2 feet above mean sea level. The almost flat character of this area would require the introduction of a few pumping stations in any satisfactory scheme of underground sewerage. Briefly speaking, the overall topography also makes it feasible to combine the sewage disposal works for Bodh Gaya and the southern riverside part of the town of Gaya, at a suitable location in the Kendua-Gopibigha belt of hamlets where the lowest contours from both sides are obtained.

Climate

1.8. The average annual maximum temperature at Gaya—the nearest weather recording station—hovers between 102—112 degrees F. during March—June, between 100-94 degrees F. during July—October and between 82-90 degrees F. during November—February, the average annual minimum temperature for the same time intervals being 57-64 degrees F, 75-64 degrees F, and 53-49 degrees F. The corresponding rainfall ranges are—0.5-6.5 inches, 13.2-2 inches and 0.5-0.9 inch, and the relative humidity figures 36-56 per cent, 80-71 per cent and 70-63 per cent. June is the hottest month when absolute maximum temperatures as high as 118 degrees F. have been recorded, but the outbreak of monsoon rain and winds thereafter considerably lowers the temperature. June—September constitute the wet months when the prevailing wind directions are easterlies and south easterlies; during the remainder, westerlies and north-westerlies dominate.

1.9. Climate of any place is the summation of temperature, humidity, rainfall and wind as well as local conditioning factors. Bodh Gaya is less hot and more humid than Gaya due to its distance from large bare hills, much smaller built-up area and larger area under vegetation. The wide and general dry sandy river front is, of course, a common denominator of both but, at the former, its wooded nature serves to dissipate considerably the radiation of heat from this source. Interestingly enough, both had a perennial water-front during the Buddha period.

THE HISTORICAL OUTLINE

Part A.—The Buddha and Bodh Gaya

The Great Renunciation

2.1. Prince Siddharta Gautama, who later became the Buddha, viz., the Enlightened One, was born in the year 623 B. C., the son of King Suddhodana of the Sakya clan, at Kapilvastu—a hundred miles north of Varanasi and within full sight of the snow-crowned Himalayas. In due course he married Yashodhara who bore him a son, Rahula. But the compassionate and contemplative prince, ever spiritually troubled by wordly trappings and sufferings, knew no peace and finally, at the age of twenty-nine, renounced the world to become a mendicant in quest of the Bodhi (Nirvana or supreme knowledge).

The Long Quest

2.2. The wandering mendicant-prince came to Rajgriha, the capital—set in the enchanting hill valley—of the Magadha Kingdom then ruled by King Bimbisara of the Shishunaga dynasty where two noted sages, Alara Kalama and Rudraka, failed to satisfy him. Along with five disciples of the latter, he left Rajgriha to meditate on the Gayasirsa hill (now known as the Brahmayoni hill on the southern outskirts of the town of Gaya) but peace still eluded him. Together they moved south into Uruvilva Vana, then an extensive beautiful forest stretching all round the confluence of the Niranjana and Mohane rivers, to practise rigid penance and austerities. Six fruitless years of mortification of the flesh made him reject this approach and he broke his fast by accepting a bowl of rice-pudding offered by Sujata, a milkmaid, under the Ajyapala banyan tree*. The five ascetics now parted company with him in anger and proceeded to Varanasi while, as tradition recorded by Fa Hian puts it, the Buddha-to-be went for a final round of meditation to a cave in the Pragbodhi hill†. Divine manifestations, in response to his request, made him immediately reject the place and he moved on towards the village of Senani.‡

Ajyapala tree.—It is to be noted that the traditional sites of Sujata's hut; Ajyapala tree; Dharmaranya—the ashram of sage Uruvela Kashyap; and Matanga-Vapi tank and temple commemorating a Jataka story all lie in the modern village of Bakraur which still retains some of its ancient attributes of a sylvan retreat. The Emperor Ashoka erected a Stupa and monolith here and a mound, apparently the ruins of the former, can still be seen; the surviving portion of the monolith was shifted, in the British period, to the town of Gaya and has recently been moved, as a result of the painstaking interest of Shri S. V. Sohoni, I.C.S., the then Commissioner of the Patna Division, to the Maha Bodhi precincts. A very picturesque and comprehensive view of Bodh Gaya is obtained from the vicinity of the Bakraur Math.

†*Cave in the Pragbodhi Hill.*—Pragbodhi (i.e., before Bodhi) hill is now known as the Dhongra hill which, rising about a mile north-east of Bakraur on the other bank of the Mohane, runs on towards Rajgriha. The Dushkar Gupha (cave) in it is presently the Dhongeswari Mai cave.

‡*Senani*—The exact location of this village is uncertain.

The Attainment of Bodhi (Nirvana)

2.3. Accepting a bundle of grass from Sotthia, a grass-cutter, on the way, he began his meditation under a Pipal tree with an unshakable vow (Vajra pratigya) not to leave his 'asana' till the attainment of Bodhi. A myriad of doubts and temptations—the allegorical evil hosts of Mara—assailed him but he conquered them all. The same night, with the full moon of the month of Vaishakha (May) softly glowing in the skies, the noble one attained Bodhi to become the Buddha, the enlightened.

2.4. Having bathed in the Sakra* tank, the Buddha now spent the first week gazing at the Bodhi tree from the north-east (Prityahara Vyuha or Kritartha Upabhoga Act), the second in walking to and from between this point and the Bodhi tree (Dirgha Chankam Act), the third in gazing at the Bodhi Mandap—his seat of Bodhi (Animesh Lochana Act), the fourth in meditation seeing the eastern and the western seas in his mind (Dahara† Chankram Act), the fifth in making circuits round the palace of the Naga King Muchilinda‡, the sixth under the Ajyapala Nyograha tree** where he made his first converts, Tapussa and Bhalluka, and the seventh in a grove of Tarayana§ tree. He returned thereafter to the Bodhi Mandap and, after sometime, thoughtfully proceeded to Sarnath (near Varanasi) to impart the Bodhi to his former ascetic colleagues who had left him. His first sermon in the deer park there propounding the wheel of law, converted them and numerous others including Ananda, henceforward to become his loving inseparable companion. Sending out now his disciples to spread the gospel, he returned to

*Sakra tank.—Hiuen Tsiang records the tradition that Sakra Devaraja, a Brahmin Raja, had a seven-gemmed throne and hall with precious substances built for the Buddha after his enlightenment. He also mentions his own visits to Sakra tank, south of the Buddha Pokhara (recently named the lotus tank) and the Muchilinda tank, east of the former. Local tradition points to a tank between Bodh Gaya and Mocharin village as the Muchilinda tank but, in absence of a tank to its west to take the place of the Sakra tank, it cannot be strongly relied upon. It may also be mentioned that two tanks, one in the Pipal Pati hamlet, south of Buddha Pokhara and the other in the Tikabigha hamlet, east of the former, would come to accord with the directions given by him.

†*Dahara Chankram Act.*—Bodh Gaya has a hamlet Dehariabigha. One cannot but wonder if it possibly commemorates the act.

‡*Muchilinda.*—The Naga King Muchilinda, a contemporary of the Buddha and the Shishunaga King Bimbisara at Rajgriha, has been consigned to a sub-human allegorical role in some texts. Apparently, he sheltered the Buddha from rain under his royal canopy, mounted with an imposing serpent crest, as a token of his homage. Mocharin, a village, about a mile south of the Maha Bodhi Temple, traditionally and obviously derives its name from Muchilinda.

**Ajyapala Nyograha tree.—From his post-Bodhi movements some writers dispute the traditional site of this tree in Bakraur, suggesting that he would not have come thus far (about a mile). It would be more natural to suppose, however, that the considerate Buddha would not have forgotten the kindness of Sujata, who lived nearly, in offering him a meal of rice-pudding after his rigorous austerities.

§*Tarayana.*—Some texts mention Rahayatna or Raja Yatna tree.

Uruvilva * where the three sage brothers Uruvela Kashyap, Gaya Kashyap and Nadi Kashyap, as also their disciples—all worshippers of fire (Agni)—joined the fold. Accompanied by them, he went to Gayasirsa hill† where a fire seen from the rockey crest of the hill provided the topic for his 'burning' sermon, exhorting all to free themselves from the fires of passion and lust. After a short stay here, the Buddha wended his way with numerous followers to the royal court at Rajgriha, and henceforward he passed away from the scene of his great consummation to preach in the Koshala, Vriji and Magadha Kingdoms till, in the year 543 B. C., came his Maha Pari-Nirvana (the Great Decease). The Master shed his mortal coils, but the pious zeal of his disciples and the missions of Emperor Ashoka made his gospel a world religion. Indeed, his personality and teachings have such a sublime and enchanting quality that, as Christmas Humpheys states in "Buddhism", the Buddha's influence has an universal character and cannot be measured by the number of his declared adherents alone.

Part B.—The Growth of Bodh Gaya

Early History

2.5. The preceding discussion gives us some glimpses of small scattered hamlets in the Uruvilva Vana and of two local kings, Naga Raja Muchilinda and Sakra Deva Raja, who ministered to the Buddha, of which the former is associated with the Mocharin village. Mocharin, lying on the riverside prong of ridge land, referred to in Chapter one, is topographically superior and still a large village—so also is Bakraur on the opposite bank of the Nilajan. But whatever might have been the earlier foci of local development, the Bodhi tree became the new focus where devotees and monks, henceforward, gathered in increasing numbers for its care and reverence as well as their own meditations.

2.6. Urel (derived from Uruvilva) and Pipal Pati (tract of the Pipal tree) were, in all probability, existing when imperial patronage came to the holy land in the reign of Ashoka (273—232 B. C.). A royal road linked it to his capital at Patliputra (modern Patna) and Stupas and monoliths came to mark all the spots hallowed by the Buddha. The Ashokan improvements at Bodh Gaya are vividly depicted in a bas-relief of the Bharhut Stupa, which shows a Pipal tree with the Vajrasana in front adorned with umbrellas and garlands and sheltered by a pillared hall, while close by stood one of his famed monoliths. A sandstone railing, about 250 feet in circuit forming the court of the Bodhi tree, with a Yakshya gateway on the east; a jewel walk shrine—a platform of carved lotuses, corresponding to the Buddha's footsteps during the Dirgha Chankam Act, under an

**Uruvilva.*—Possibly the Urel hamlet in Bodh Gaya commemorates this visit. The name is obviously derived from Uruvilva.

†*Gayasirsa Hill.*—The Brahmayoni hill skirting the town of Gaya on the south, has a Budhubigha hamlet at its foot. About a mile away from the hamlet, there is a spring in the hill.

arched structure; Stupas marking other sites in the vicinity hallowed by the Buddha; monastery and other buildings to meet the needs of the royal entourage during his long stay were also constructed by Ashoka. There can be little doubt that the transformations effected by him were extensive and gave the holy land a splendid grandeur and majesty, movingly heightening its serenity, and comparable with his other creations.

2.7. It would seem that Emperor Ashoka's Bodh Gaya had decayed but not altogether disappeared by the time we come to the neo-Mitra dynasty. Kurungi, wife of King Indragni Mitra, as also Sirima and Naga Devi, wife of King Brahma Mitra, Amogha, Bodhirakshita and others led a process of restoration, which would seem to have faithfully followed the Ashokan style. The noble lady also put up two abodes on high ground to the north, one for monks and the other 'Kaushikiputra Indragni Mitra Rajapassad' (Royal palace) for her own use. The prosperity of Bodh Gaya in the neo-Mitra period must have, on the whole, continued through the Kushan period. The Kushan were devoted Buddhists, great patrons of art and learning and introduced for the first time an image worship of the Buddha.

2.8. The late Dr. K. P. Jayaswal fills in the subsequent period with his "History of India, *c.* 150 A. D. to 350 A. D. Naga—Vakataka Imperial Period". While many of his conclusions do not rationally flow from the facts at his disposal, it is interesting all the same to note the tolerance of the Naga-Vakataka Kings towards Buddhism and the particular attachment of the royal ladies to it. Bodh Gaya would, therefore, have certainly benefited from it, and two of the three monasteries, perhaps a smaller Maha Bodhi temple structure corresponding to the enlarged court formed by the granite railings, and a number of other shrines seen by Fa Hian may be assigned to the Naga-Vakataka, or the early Gupta period.

2.9. During the Gupta period (when the imperial capital lay at Ayodhya) from 320 to 490 A. D., there is a record of the installation of two images of the Buddha in 382-383 A. D.; the inscription also mentions the reign of a King Trika Mala who may be conjectured to have some association with the Tikabigha hamlet on the river bank near Urel. More significant was the construction in 388 A. D., by King Megha Varma of Ceylon of a splendid monastery (Sangharam) with three lofty towers and surrounded by a wall 30 feet or 40 feet high. When Fa Hian visited the region in 409 A. D., he found the city of Gaya desolate and the holy places of Bodh Gaya surrounded by forests. But within Bodh Gaya itself, he was delighted to come across a thousand monks, revered by the local populace and supplied with all needs, living in three monasteries; and a large number of shrines.

2.10. Hiuen Tsiang, who visited India in 630-645 A. D. during the reign of King Harsha, provides us a detailed account of Bodh Gaya thereafter. The present Maha Bodhi Temple structure, with a third and final enlargement of its court, had definitely come into being. He also recorded the existence of the Ceylonese monastery, tenanted by more than a thousand monks including a number from Ceylon, with six hills and three-storeyed observation towers, enclosed by a high wall of defence and situated outside the northern gate of the outer wall of the Maha Bodhi Temple. He described twenty-one Stupas—some of them high and large and containing bone-relics—such as the Ashoka Stupa, the Kumkum Stupa, etc., dedicated to episodes connected with the Buddha like his visit to Praglodhi hill, Sakra disguised as grass-cutter offering a bundle of grass, etc. He

further mentions three tanks (Buddha, Sakra and Muchilinda), five smaller temples (one to the north-west of the Bodhi Tree—the Ratnagriha Chaitya; two also to the north-west containing images of the earth spirit Vashundhara; one on the bank of the Muchilinda tank and another in a wood to its east, the fifth in a cave in the Pragbodhi hill) as well as a number of monoliths in the vicinity.

Mediaeval Period

2.11. Hiuen Tsiang's description is, thus, of a prosperous town—interestingly enough, his records show the nearby town of Gaya as thinly populated, well defended and difficult of access. The prosperity of Bodh Gaya continued in the Pala period, during which kings of this dynasty and devotees from different parts of India and Ceylon put up a number of shrines and statues, and a steady stream of pilgrims including many from China and Tibet flowed in. Its decline began with the overthrow of the Pala dynasty by the Sena during the middle of the eleventh century; an inscription dated 1060 A. D. by Vajrapani, Governor of Nayapala, states that he raised the city of Gaya from a small place into an Amravati (legendary capital of the gods).

When the last king of the dynasty, Lakshmana Sena, came to the throne towards the end of the twelfth century, no monasteries existed and the Temple itself was decaying. Though Ashoka Valla, the pious Buddhist King of Shivalika, had a new monastery built and Purushottama, King of Kama, a shrine as also a few other devotees, while the Maha Bodhi was restored through costly repairs by the Burmese King Letyaminan, the revival was a short-lived one due to the sack of eastern India by Bukhtiar Khilji in 1197 A. D. Terrified by the slaughter and destruction at Nalanda and other places, the monks, and a considerable portion of the population, fled from Bodh Gaya.

2.12. During the long and darkest period of the town's history which now began, there are brief glimpses of the grant of a village to a Ceylonese monk Mangala-swami for the maintenance of the Temple, a local King Amar Singh, the sack of Bodh Gaya itself and repairs of the Temple by a Burmese mission at the close of the fifteenth century. All the same when Gosin Giri, the ascetic founder of the present line of Mahants (abbots) of the local Shaivite Hindu Math (monastery), arrived in 1590 'attracted by the sylvan solitude of the place', Bodh Gaya was covered with jungles and excluding the decaying—but still nobly holding on—Maha Bodhi Temple, utterly in ruins. During the seventeenth century, the Math received the grant of the village of Faradih (also known as Mastipur in which the Temple lies) from the Moghul emperor Muhammad Shah; another Burmese mission undertook some repairs and a pagoda was constructed at the command of the Chinese Emperor.

2.13. The reviving importance of the Maha Bodhi precincts had already led to the gravitation of the Math from the north to its present site, east of the Temple and commanding an extensive river-front, by 1811 when Buchanan Hamilton visited the place, following the passage of the administrative control of eastern India into British hands in 1764. His records further show that the ruins had been extensively utilised as a quarry for building materials and, while the Bodhi tree was still an object of worship, the Maha Bodhi Temple itself was 'in the last stages of decay compatible with anything like a preservation of its original form'. 'The report of

the Burmese Mission in 1833 shows the great difficulty it had in tracing out Bodh Gaya, and the jungles and dilapidation at the holy land. The same picture broadly held, apart from the construction of some other denominational shrines and a Muslim burial-ground in the archaeological Temple sector, till the dawn of the modern period in 1876 when the town of Gaya was first linked by rail to Patna. Other rail lines came up during 1876-1909 to make this rail-head of Bodh Gaya an important rail junction.

Modern Period

2.14. The coming of rail in 1876 concided with the despatch of a delegation of officials and workmen, for the restoration of the Maha Bodhi Temple and construction of a rest-house, by King Mindoon Min of Burma. It soon appeared, however, that the work was being done without regard to archaeological fitness and, after due investigation by Rajendra Lal Mitra, the Government of India took the work of restoration into its own hands. The great task was accomplished by Cunningham and Mitra in 1884 with laudable care and painstaking interest, though it was unfortunate to a degree that the Burmese rest-house (since removed) and the officials' bungalow took up a further slice of archaeologically rich land and the huge spoils of earth (which had more than filled up the Temple-court through centuries of neglect) were deposited nearby leading to the subsequent growth of hamlets close to the Temple. Two other important landmarks of the period were the visit of Sir Edwin Arnold, the inspired poet of 'The Light of Asia', in 1885 and a world Buddhist Congress in 1891.

2.15. At the dawn of the twentieth century, the Math and the Maha Bodhi had emerged sharply into focus as crucial socio-economic forces and the pattern of the town's distribution of population and residential neighbourhoods had become fixed, more or less, into its present mould. The year 1901 saw another building, the present Maha Bodhi Vihara, built in the archaeological area and, a few years later, the police-station and the hospital buildings came into existence—the latter, again, in the same area. These developments, along with the increased flow of pilgrims, obviously made Bodh Gaya a local economic dominant and a market grew up in the Temple sector between the Math and the Temple precincts in a grossly insufficient ribbon of roadside land.

2.16. The third decade witnessed the addition of two more buildings, the Tibetan monastery and rest-house (1938) and the Birla rest-house and Stupa (1940), of importance in the archaeological area; the Chinese monastery and rest-house (1935) and the Burmese monastery and rest-house (1939) fortunately avoided it. Apart from normal town growth chiefly centred in and around the Temple sector, this townscape projected itself, in 1947, into independent India. A programme of community development, making Bodh Gaya the seat of the rural block administration and legislation, laudably cutting a gordian knot by establishing a Temple Management Committee followed. In 1954, a Samanwaya Ashram, associated with Vinoba Bhave, came to be established within the archaeological area of the Temple sector.

2.17. Preparations for the 2500th anniversary of the Maha Parinirvana of the Buddha, celebrated in May 1956, made the year 1955-56 an unforgettable landmark in the history of the holy land. In addition to the improvement of regional communications and

tourist facilities, the Maha Bodhi Temple and precincts underwent a faithful and aesthetic restoration; a central government rest-house and a museum came up on cleared land within the archaeological area to which the Public Health Engineering Department added its own contribution by putting up a water tower, office and staff quarters. A tourist dormitory was constructed and utility services (water-supply, sewerage and electricity) were introduced in the town. A vast gathering paid its reverent homage to the Lord, while a full moon of the month of Vaishakha bathed the Maha Bodhi in a silvery shoon.

2.18. Among more recent developments are the Thai Temple, monastery and rest-house—a pleasing ensemble adjoining the dormitory; a resettlement colony behind it, normal expansion in the government, private residential and market areas. A decision has already been taken to locate the Magadha University here along the Gaya-Dobhi Road, and its correlation with the rest of town development must form an important constituent of the Master Plan. Obviously, at this holy land of rich and noble memories, technology must subserve higher ends and, imbibing the spirit of its renaissance, recreate the old glory in its new setting.

THE DEMOGRAPHIC PERSPECTIVE

Population Structure

3.1. In the first Chapter on 'Topography and Climate', a reference has been made to the seven sectors, viz., the Temple, northern, southern river-front, south-western, north-western and western sectors, into which the town development can be divided. The second Chapter on 'The Historical Outline' has introduced a Bakraur sector, principally in terms of its archaeological importance and aesthetic environs, and has further woven together in a pattern the growth, decay and renaissance of the town. The present Chapter provides the social and human content of present day Bodh Gaya, which must intimately guide the overall planning process in all democracies. .

3.2. The revenue villages of Bodh Gaya and Mastipur (also known as Taradih or Taridih in which the Maha Bodhi Temple lies) cover an approximately square area of 2,714 acres (4.24 square miles) stretching from the river-front to a little beyond the Gaya-Dobhi Road on the west. Together they constitute the town of Bodh Gaya, the population of which, according to the 1961 Census, is 6,299 persons—3,673 males and 2,626 females. The corresponding female ratio of 0.72 would, from a superficial reading, seem to compare unfavourably with the higher and better ratio of 0.83 in the town of Gaya and to reflect a malady characteristic of the metropolitan and industrial towns in India. The phenomenon, however, has a different base in the large institutional (monasteries, etc.) population of 782 males and 4 females, deducting which the residual population of 2,891 males and 2,622 females works out to a female-male ratio of 0.9 only. Excluding the urbanised Temple sector altogether, it further appreciates to 0.98 (virtually unity) reflecting the rural setting with which visitors to Bodh Gaya are familiar.

3.3. Special occasions apart the institutional population, constituting 12% of the total population, gives us a measure of the monastic and tourist facilities required here; to it must be added many who come here for a few hours only. Scheduled and Backward Classes

cover another 72% approximately and Muslims and the so-called higher classes share about 8% each. An analysis, in detail, is hardly necessary to emphasise the bias which economic development here must, inevitably, have and, in the context of a limited availability of agricultural land, the key role of rural industries. From a study of the community spectrum, the scope of the latter easily covers dairy, leather goods, pisciculture, pottery, carpentry and handicrafts, for which, along with agricultural needs in general, provision has to be made in the Master Plan.

Age Structure and Literacy

3.4. Excluding the institutional population, the following table shows the overall age structure of the town population :—

Up to 3 years	...	...	6%
4—10 years	...	...	18%
11—16 years	...	...	17.7%
17—20 years	...	...	11.6%
21—30 years	...	...	15.7%
31—40 years	...	...	12.2%
41—50 years	...	...	11.5%
51—60 years	...	...	6%
Over sixty years	...	...	1.3%

The percentage of adult population, over the age of 20 years, thus stands at 46.6, which appreciates to 53.3 in terms of the absolute population of the town. Expressed in similar terms, the school-going group of 4—16 years depreciates from 35.7% to 31%. Further, though the overall percentage of literacy is 31.3, it drops sharply to a range of 15—22 outside the Temple sector and, while the overall male literacy of 48.2% may appear encouraging, it should not be forgotten that the overwhelming bulk of institutional population belongs to the male literate category. The overall female literacy of 8% is a certainly depressing picture, and, on the whole, the need for greater educational facilities is rendered obvious.

Economy

3.5. The present working force at Bodh Gaya comprises of 2,545 persons—1,623 males and 922 females; its percentage in terms of absolute population is 40 which has a somewhat artificial character due to the inclusion of the institutional population. Excluding the latter, the working force constitutes 46% of the population, its male component being 56.2% of the male population and the female component 35.1% of the female population. 50% of the male working force and 78.4% of the female working force is engaged in agricultural cultivation and labour. The following table gives the distribution of the working force in different categories :—

Cultivation	...	...	29%
Household industry	...	...	8%
Trade and Commerce		...	6.5%
Agricultural labour		...	31%
Manufacture of other household industry.			2.2%
Transport	...	...	4%
Primary occupations (e. g., fishing, orchards, etc.).		...	1.8%
Construction	...	...	1.8%
Other services	...	...	15.7%

Further, as one recedes from the Maha Bodhi Temple, agricultural cultivation and labour provide almost the entire sustenance in the remote hamlets.

3.6. The above economic picture, viewed in conjunction with Bodh Gaya's community structure, shows basic anomalies. With its large community of milkmen and fishermen, etc., there would appear to be no valid reason for the third category of primary occupations (orchards, plantations, forestry, livestock, fishing and allied activities) to be as low as 1.8%. Similarly, the existence, in bulk of other communities with the required skill should have led to a higher dependence on the fourth and fifth categories, viz., household industry and manufacture other than household industry than the present percentage of 10.2. The goal of economic planning here must, as a consequence, be the provision of opportunities through intensified cultivation and rural-industrialisation already discussed by us, leading to the development of its full economic potential and the amelioration thereby, of the present imbalances in the economy. The Master Plan has to assist the above task by a minimum dislocation of the rural process, conservation of agricultural land and the integration of irrigation, farms, rural industries, etc., within its overall framework.

Household Structure

3.7. The town exhibits a very complex household structure, as can be seen from the following table :—

1-2 persons households	...	10%
3-4 persons households	...	21%
5-6 persons households	...	26.3%
7-8 persons households	...	17%
9-10 persons households	...	12%
11-12 persons households	...	5.7%
13-15 persons households	...	4.5%
Over 15 persons households	...	3.5%

The phenomenon reflects the economic rural base of the town and gradually disintegrating joint family system, though some very large households are inevitable in a monastic and tourist town. However, the disintegration has still to proceed far, before the overall average household size of six persons can be taken as representative enough to become a thumb-rule for any housing programme.

Population Trend and Optimum Size

3.8. The town region of Gaya falls as it were, in the shadow region of the State capital, Patna, on the north; the industrial town of Dehri-on-Sone (where the twain, the Grand Trunk Road and the railway linking Delhi and Calcutta, meet) and the rapidly urbanising mineral and industrial belt of Chotanagpur on the south-east. Its function in the past, as also in the foreseeable future, is that of the apex regional town for the district having a predominantly backward and rural economy. As a matter of fact, the Gaya district, as a whole, has shown a very slow pace of urbanisation and any change in its present characteristics as a source of migration to other regions with increasingly better promise of employment, is most unlikely. During the last decade, the town of Gaya as also Bodh Gaya has recorded a growth of only 12%.

3.9. A slow rate of growth at any town is a sociological asset and, further, gives the authorities a breathing time for action. The principle holds with greater force in the case of Bodh Gaya for, as stated in the preamble, "A historic town of its character should be allowed to increase in size only to the extent it intensifies and enhances its character and attractions; any development envisaged must serve to strengthen, to crystallise its existing functions and assets and, in no

way, to compromise or obscure these qualities." We, therefore, neither propose, nor anticipate from the overall context, a higher decennial rate of growth than 12%, in the coming future, at Bodh Gaya under a normal momentum. Put in round figures, this envisages a population of about 8,000 persons in the year 1981 and, since the proposed university may, directly and indirectly, introduce another 6,000 persons largely in its own sector, the envisaged total can be put at 14,000.

3.10. Coming to the question of an optimum size—still a vexed issue in town planning—there would be common agreement as to the high desirability of a small size for Bodh Gaya. As Sir Patrick Abercrombie, a noted Town Planner, puts it "There is much to be said, in the case of a town or city noted on some individual account, for maintaining a small size, because then its amenities and attributes are much more readily grasped and assimilated". But—to use a trite but expressive phrase—how small is small? Ebenezer Howard, protagonist of the garden city movement, put it at 30,000, a figure broadly accepted in the British New Towns Act in the context of dispersal of industries and industrial population. To accept it for Bodh Gaya would, as a corollary, mean the acceptance of a basic change in its economy, its society and character—none of which we desire. Its optimum size is, however, an obvious function of its historical, archaeological and spiritual aspects (which highlight the need for serenity and of sizeable amounts of land for related uses); the character and capacity of its rural economy (which requires the conservation of land for such purposes) bolstered by intensified cultivation, rural industries and increased tourism; its other functions as the seat of a rural block administration, etc., the proposed university and a local market for surrounding villages, as also the desirability of making the civic services and amenities, more or less, a self-supporting proposition. On these premises, a calculation gives the following results :—

Population directly living off agricultural land (at 0.5 acre per person) and primary occupations.	4,500
Population in rural and service industries.	2,250—4,500
Population in trade and services ...	3,000—4,000
Population in university sector ...	5,000
Other institutional population ...	2,000
Optimum size of town (maximum value).	16,750—20,000

	Rs.
Approximate annual depreciation and maintenance costs of roads, civic services and amenities.	75,000
Share of above costs borne by university and tourists.	(—) 30,000
Share of above costs borne by remaining town population.	45,000

Obviously, the above computation leans heavily on the liberal side and is a guide rather than a gospel. It does serve to show, however, that a viable maximum figure of optimum population of Bodh Gaya, from all considerations, does not exceed 20,000 persons and any proposed increases above it would have to be supported through the induction of other industries at a further loss of the serenity of the environs. All in all, therefore, its Master Plan has to keep an ultimate population of 20,000 in view.

LAND USE, HOUSING AND RESIDENTIAL DENSITIES

4.1. The preceding Chapter has sharpened our vision of the socio-economic base of Bodh Gaya through a discussion of its population structure, economy, household structure, population trend and optimum size. The present Chapter carries the process a step forward through a study of the existing pattern of land use, housing and residential densities, so as to discover their anomalies and shortcomings as well as the guide lines of an integrated development of the town.

Land Use

4.2. The overall land use at Bodh Gaya is set into focus by the following table :—

	Acres.
Area under cultivation	2,126
Fallow areas required for agriculture operations.	42
Orchards	31
Area under half-width of river falling in territorial limits.	168
Tanks and channels	60
Major approach roads	68
Residual land	219
Total area of Bodh Gaya town (viz., revenue villages of Bodh Gaya and Mastipur).	2,714

The town, thus, presently lives and functions (non-agriculturally) in the ' residual land ' of 219 acres. It is also seen that, apart from it, only a total of 2,259 acres is available for agriculture, removal of existing deficiencies in urban land uses, university and other needs of future town expansion. In the context of Bodh Gaya's envisaged economic pattern and maximum population, rural-industrial support here—already stressed by us—now crystallises as a supreme necessity.

4.3. Within the above ' residual land ' the detailed land uses have the following complexion :—

	Acres.
Roads	12
Public and semi-public uses (Government offices, hospital, library, museum, Maha Bodhi and other temples).	14.5
Residential area	60
Public open spaces	8
Schools (including high school area)	5
Commercial area	1
Monasteries and rest-houses ...	33
Burial-ground, etc.	4
Utility services (including sewage disposal works area).	3.5
Total developed area	141
Balance under Government ownership (undeveloped land in the S. W. sector and unbuilt archaeological area in the temple sector).	78
GRAND TOTAL	219

Considerable deficiencies in many important land uses within the developed area of 141 acres are, thus, seen to exist and even this total includes a large chunk—about 35 acres, excluding the *math* area of about 20 acres—of undesirably exploited land in the archaeological Temple sector. We refrain, at this stage, to provide these deficiencies an exact dimension on the basis of a thumb-rule application of common standards, for the peculiar and competitive requirements of space at Bodh Gaya necessitate a detailed consideration of the planning standards to be adopted for this highly individualistic town. Other salient features of the existing land use pattern—a crucial determinant of any Master Plan—can, however, be considered here.

4.4. The existing land use map highlights an almost tragic exploitation of the archaeological area for far less significant uses, and the consequent confusion of multifarious land uses in the Temple sector. Even unrelated pedestrian and vehicular traffic concentrates, as a result, within it and the position is further aggravated by the acute paucity of roads within the town. The highly undesirable locations and gross inadequacies of space of the high school, hospital, sewage disposal works, commercial area, etc., are also evident. Public open spaces, apart from the long strip of about eight acres to the west of the Temple, do not exist in terms of such essential uses as meditation and smaller (particularly children's) parks; playing-fields; and an aesthetic landscape park, reaching up to the river-front, around the Maha Bodhi. The trans-regional high tension electricity line runs through the present development and the location of the State Seed Multiplication Farm precludes the construction of any farm buildings in it as the Temple vista would be adversely affected thereby.

4.5. Excluding the Temple sector where it has rationally no place, contiguous residential development is seen to be a feature only of the northern sector (population 2,003); the rest is scattered. Further the 'tolas' of Janpur and Bhagwanpur are remote enough to be left in the agricultural green belt, which would obviously have to reach up to the Temple to maintain a good vista from the major approach roads. The northern sector, thus, stands out (with all its drawbacks of ribbonated growth, etc.) as a natural area for the promotion of future residential development so as to make it a viable neighbourhood-group. As a corollary, it guides the future location of a number of important land uses, e.g., rehabilitation, commerce, high school, rural industries, etc. It is also to be noted that the spill of contiguous residential development into the adjoining revenue villages of Amawan and Neutapur, introduces an additional area and population of about 600 persons into this sector.

4.6. In addition to the northern sector, the existing growth—block office and Government employees' quarters; rehabilitation colony; tourist dormitory and the beautiful ensemble of the Thai temple, monastery and rest-house; library, etc.—points out the recent and government-sponsored south-western sector as another major area, where development has, however, to be largely promoted through an increasing compaction of land uses. Together with the university sector, the needs of Bodh Gaya's future growth of population have thus to be worked out within these three sectors, while archaeological, spiritual and Temple needs—intimately bringing in a considerable area of aesthetic landscape—naturally fit in the Temple, southern (with its fringe of rich orchards), river-front and, to some extent due to its historical and archaeological importance and sylvan environs, in the Bakraur sector on the

opposite bank of the Niranjana. The last aspect, further, brings in the desirability of providing satisfactory communications across the river (as also from Bakraur to Prag Bodhi hill across the Mohane) and creating a perennial water-front. On the whole, therefore, a study of the existing land use pattern in the context of preceding chapters, has brought the outline of a Master Plan into focus.

Housing

4.7. Housing can be evaluated qualitatively, quantitatively and in social terms; the persons per room ratio (p. p. r.) and habitable area per person—obvious indices of overcrowding—form additional yardsticks. Qualitatively the picture is given below :—

Dwellings with thatched and mud walls.	75%
Dwellings with unburnt brick walls.	4%
Dwellings with burnt brick walls.	21%
Dwellings with thatched roof	41%
Dwellings with tiled roofs ...	50%
Dwellings with *pucca* roofs ...	9%

As a matter of fact, excluding institutional, governmental and business areas falling in the Temple and south-western sectors, almost the entire bulk of residual housing belongs to the *kutcha* category and lacks such basic amenities as piped water and sanitary facilities inside the dwelling.

4.8. Quantitatively, the difference between the number of census dwellings and census households readily indicates a shortage of 175 dwellings. Further, while the overall p. p. r. of 1.7 does not indicate any significant overcrowding, the p. p. rs. in the case of households with one and two rooms give, as can be seen from the following table, an obvious reflection of the shortage of two-room dwellings :—

Dwellings with—	Percentage.	Persons per room ratio.
One room ...	33	3
Two rooms ...	18	2
Three rooms ...	12	1.8
Four rooms ...	16	1.8
Five or more rooms.	20	1.1

With this perspective, the total shortage of housing—excluding the large backlog of obsolete housing—may be put at 385 dwellings.

4.9. In social terms, the small habitable area per person, the high density huddle of housing in non-institutional (including governmental) residential areas and the absence of proper and adequate schools, parks and playing-fields—particularly for children, and community centres—constitute obvious drawbacks. But, while almost the entire range of housing at Bodh Gaya presents a condition requiring serious ameliorative efforts, we would suggest—in view of the distinction between need and demand, complexities of the slowly changing rural society and financial costs—that the solution should largely be sought through aided self-help on a co-operative community basis.

Residential Densities

4.10. The gross density over residential areas presently stands at 92 persons per acre and, as seen

from the table, varies over a wide range within different 'tolas' (neighbourhoods)—

Sector.	Neighbourhood or 'tola'.	Population.	Gross residential area in acres.	Density persons/acre.
Northern..	Dehariabigha	265	0.9	293
	Upadhyaybigha	195	1.1	177
	Rajapur ..	204	2.9	70
	Sonubigha ..	123	0.9	137
	Pachhati ..	1,184	7.5	158
	TOTAL ..	1,971	13.3	148
Temple ..	Bodh Gaya Bazar.	793	7.4	107
	Taridih ..	998	10.2	98
	TOTAL ..	1,791	17.6	102
Southern..	Tikabigha ..	389	3.1	122
	Urel ..	73	0.8	91
	TOTAL ..	462	3.9	119
South-Western.	Pipalpati ..	150	1.0	150
	Mastipur ..	97	0.7	139
	Taridih (new)	267	13.5	20
	TOTAL ..	514	15.2	34
North-Western.	Miabigha ..	157	1.4	112
	Janpur ..	279	2.2	122
	Bhagwanpur	232	3.8	61
	Baijubigha	107	2.6	41
	TOTAL ..	775	10	78
	GRAND TOTAL	5,513	60.0	92

Apart from grossly overcrowded areas, the analysis also throws up the fact that most of the neighbourhoods have an insufficient size of population for supporting infant and primary schools and other community foci within them.

4.11. Another revealing deduction from the above statistics is the fact that, excluding the 'tolas' (neighbourhoods) of Janpur and Bhagwanpur (which, from their remoteness, can be appropriately left in the green belt) and the recent low-density development in the south-western sector, 75 per cent of the total town population—or, in other words, 86 per cent of the total

non-institutional population—lives at an average density of 117 persons per acre of the remaining gross residential area of 40.5 acres. This density can be obtained in a planned horizontal lay-out of about 8.6 acres per 1,000 persons, adopting the existing overall p. p. r. of 1.7; forty-five 24′ × 40′ plots per acre of the net residential area; row housing in the form of blocks, spaced 10′ apart, of 8 two-room dwellings; and a meagre provision for access and public open spaces at about 25 per cent of the gross residential area. If the latter provision, as also the unbuilt plot areas, becomes just nominal, housing conditions deplorably worsen but a vital area for cultivation—particularly of money crops in the vicinity—is thereby released: significantly enough, this is the representative picture of the bulk of housing at Bodh Gaya and we, thus, see how the economic compulsions of a depressed economy have led to the sacrifice of even the minimum amenities.

4.12. The question of residential densities here has, therefore, to be viewed in the context of two important aspects arising out of the above discussion. Row housing is the form of housing, the bulk of its population comprised mostly of the very poor classes—is now used to and, since it is most economical both in terms of overall development costs and building cost per dwelling, it deserves to be retained as the preponderant form of future housing. Secondly, economic compulsions stress the necessity of vegetable gardens as integral parts of such housing. If, in the light of these twin considerations, the plot sizes are now appreciated to 24′ × 60′ while other standards are kept as before, the average density of persons per acre of the gross residential area drops to about 83 from its preceding value of 117. Further, since cross-ventilation is the paramount factor of housing design in the hot and humid tropics, dwellings with three or more rooms would have to be provided in the form of semi-detached and a small proportion of detached housing, due to which the average density would come down still further. Viewed in conjunction with the need of appreciating the theoretical percentage of 25 for access roads and public open spaces in the gross residential area, it is thus seen that a realistically desirable average density per acre of the gross residential area—so far as the bulk of housing is concerned—would be about 70. Even this density would, however, be attainable in the northern sector only and would drop to about one-half to one-quarter of it in the south-western and university sectors respectively, due to increasingly superior requirements.

4.13. Coming next to the aspect of a desirable size for the residential neighbourhoods, it would obviously be undesirable—in the context of Bodh Gaya's rural background, envisaged economy and population—to make them very large. If the infant school for the age-group 3+ to 5+ (not all of whom would attend) is conceived as the focus of a housing area and about four of them put in a neighbourhood, a desirable population for the latter can, in the light of the age structure, be put at about 2,500, which would give a viable unit for supporting a co-educational junior school for about 200 students in the age-group 6+ to 8+, a community hall and three to four shops for daily needs. Even at this comparatively low figure from urban standards, we find the existing tolas far below the mark and compaction would have to be brought about through a judicious resettlement of displaced tolas and guidance of future housing. Care would naturally have to be taken, in the above process, to retain the existing bonds of neighbourlines by the rehabilitation of the population of each displaced tola at one place.

MAHA BODHI AND RELATED ASPECTS

5.1. A stage has now been reached where, prior to an examination of the remaining aspects, i.e., cultural, recreational and educational facilities; business and commercial needs; communications; health and utility services, etc., of normal town development, the Maha Bodhi and related needs are required to be placed in a sharper focus. The scope of the present Chapter is outlined by the following extracts from the preamble and the land use section of the preceding Chapter :—

> Obviously, at this holy land of rich and noble memories, technology must observe higher ends, and, imbibing the spirit of its renaissance, recreate the old glory in its new setting'. (Preamble.)
>
> In addition to the northern sector, the existing growth—block office and government employees' quarters, rehabilitation colony, tourist dormitory and the beautiful ensemble of the Thai temple, monastery and rest-house, library, etc.—points out the recent and government-sponsored south-western sector as another major area where development has, however, to be largely promoted through an increasing compaction of land uses. Together with the university sector, the needs of Bodh Gaya's future growth of population have thus to be worked out within these three sectors, while archaeological, spiritual and Temple needs—intimately bringing in considerable areas of aesthetic landscape—naturally fit in the Temple, southern (with its fringe of rich orchards), river-front and, to some extent due to its historical and archaeological importance and sylvan environs, the Bakraur sector on the opposite bank of the Niranjana. The last aspect further brings in the desirability of providing satisfactory communications across the river (as also to Prag Bodhi hill across the Mohane) and creating a perennial water-front'. (Para. 4.6 of preceding Chapter.)

The preservation of the Central Vista from the approach roads; the enhancement of serenity and aesthetic beauty in the town and temple precincts; and convenience of approach to other sites hallowed by Buddha during his meditations in Uruvilva Vana (an enchanting foreign region then covering the present town and environs) have, therefore, to form the key-notes of planning here. Equally important at this stage great tourist Centre, indeed, the greatest centre of World Buddhist Pilgrimage, are needs of tourist homes and camping grounds, monasteries, meditation and recreation parks, etc. Its rich archaeological character, illustrated by the discoveries of Cunningham and Mitra and the definition of the town by a green belt provide other major perspectives governing the Master Plan.

Preservation of Temple Vista

5.2. We have already noted in the Chapter on the Geographical Background that the prong of ridge-land, atop which the Gaya-Dobhi (G. T. link) Road runs, introduces a cross-fall towards the Temple precincts modifying thereby the overall slope of land from south to north. Since the Temple area itself is situated on an artificial (and local) elevation of about 415 ± 5′ above mean sea level, approximating that of the ridge-land in

the vicinity, while the surrounding land, on which development is proposed, has an elevation of only $397 \pm 2'$, it is obvious that any single storeyed construction on the latter would have no effect on the visibility of the Temple from the link road. Even the spires of a few monastic temples, rising to a height of about 50—60′ would only lend colour and substance to an otherwise monotonous uniformly horizontal development, rather than cause a serious interruption of the view of the Maha Bodhi with its dominating structure rising to about 150′ above the ground level of its precincts. But any significant linear development, whatever its height, along the eastern fringe of the link road would completely close the view from it and a modification of the present linear site of the Magadha University along it should therefore be given a very serious consideration.

5.3. The constituents of a university sector are its senate and administrative buildings; hostels; library; colleges and other ancillary buildings; residential quarters for teaching and other staff; playing-fields and, desirably, some farm land for a dairy and other purposes. Ideally the entire ensemble should form a compact campus on the western side of the link road but, since a free grant of land—the bulk of which lies in the form of a linear site along its eastern side—due to the generosity of the Mahant of Bodh Gaya introduces economic considerations in the picture, it would be realistically desirable to utilise this land for the bigger playing-fields, farm-land and staff residential quarters. The latter would obviously have a horizontal and low-density (in the context of the large number of superior teaching staff involved) lay-out in a comparatively smaller and compact area; the small built-up area and provision of children's playing-fields, etc., within the neighbourhood would leave sufficient open spaces so as not to drastically curtail the existing view. We may also add—perhaps without the necessity of an elaboration—that the segregation of the staff residential area from those of student-activity would be an obvious asset.

5.4. The access artery from the link road runs almost parallel and a little to the south of the Temple axis; any significant development abutting it to the north is, therefore, excluded. Along the riverside approach road, lined by wooded areas, the Temple view would obviously remain unaffected by any horizontal development. The entire preceding discussion on this aspect needs, however, to be qualified by an important realisation that vista is not merely a function of visibility but also of the setting along which the view is obtained. The latter can be secured along a line of shacks or monotonous planned development; along an avenue of trees or formalised garden; and along the natural landscape of a green belt, with an occasional tree or group of trees providing both harmony and contrast, penetrating right up to the dominant—yet the spiritual reaction would be different in each case. The most soul-filling experiences are generally derived from natural landscapes, which further conserve land for agricultural uses.

Serenity and Beauty of Temple Precincts

5.5. As has already been pointed out in the last Chapter, serenity in the Temple sector is affected by the concentration of multifarious land uses within it and is further aggravated by the acute paucity of roads, which makes even unrelated traffic pass through it. If land uses, apart from the Temple, are shifted to other locations, the stretch of the P. W. D. road in the Temple sector, can be converted into a pathway lined by shrubs and low-flowering trees; a specific area would also be

released thereby for the outer circuit (*parikrama*) of the Temple quadrangle performed by the devotees. There would still remain, however, a strong competition between the needs of archaeological excavation in a potentially rich area and the landscape needs of the Temple sector—obviously, excavations cannot be brought right to the edge of the Temple quadrangle.

5.6. Balancing the above competitive needs, an area of about 75 acres, approximately a rectangle—bounded, more or less, by the drainage channels on the west and south; the Math and the river-front on the east; and the extended back-line of the Tibetan monastery and other institutions on the north—naturally suggests itself as a landscape reservation for the Temple precincts. Ideally no structures, apart from the Maha Bodhi Temple and quadrangle, should exist within this area but, in practical terms, we envisage that, while residential, business and commercial uses could be expeditiously removed, the hard core formed by the shrines, monasteries, museum, central government rest-house and the water tower would remain within it for long.

5.7. The treatment of the above reservation has, therefore, not only to provide a pleasant contract with the green belt penetrating up to the Temple precincts, and a befitting setting for the Maha Bodhi, but also to make the difficult integration of the above residual structures possible. To our concept, the treatment should reflect an honest and sensible utilisation primarily of the gifts of nature rather than the ostentations of man, and a simplicity and harmony of functions rather than an induction of new confusions to supplant the discarded old ones. Thus while velvety lawns and flower-beds fringed with shrubs; fountains, pools and rockery garden; pathways and avenues lined with coniferous ferns and low-flowering trees—as also subtly placed clumps of shady trees, lighting and park-furniture—have their natural place in it, care has to be taken to avoid a multiplicity of ostentatious and pseudo-artistic structures or sculptures and functions. Within the above compass, the garden can also become an expression of Bodh Gaya's international personality through the allotment of parcels of land for different national gardens. To sum up, while any dogmatic approach is farthest from our mind, our concern is that the objective itself—the enhancement of serenity and aesthetic beauty—should not suffer in the process of creating an environment worthy of the sacred precincts.

Archaeological Excavation

5.8. The Chapter on 'The Historical Outline' provides a picture, to the extent available, of the unfolding of a rich history here, of which no tangible signs, *in situ*, remain due to the ravages of man and nature except for the Maha Bodhi and some monuments in, or abutting, its quadrangle. Great importance thus attaches to the exploration of presently shapeless mounds and it is singularly unfortunate that, even after the discoveries of Cunningham and Mitra during the restoration (1884)—some of which can be seen in the local museum while others were sent out—archaeological areas were neither excavated nor given the protection of the existing legislation to preserve the ruins. However, with a growing realisation of Bodh Gaya as one of the greatest and noblest heritages of the nation, a serious consideration is being given to this aspect. Since the town's Master Plan must assist the task, a discussion of the various facets involved becomes necessary.

5.9. Outstanding among the areas of archaeological potential, is naturally the Temple sector. Excluding the landscape reservation discussed above, the remainder of

the mound to the north, thus constitutes an important area for archaeological excavation. The present land uses, viz., a burial-ground, Samanwaya Ashram, hospital and government employees' quarters, private residential development of a minor character, etc., must all be speedily removed from this area, but, even as it is, the bulk of the land is free from development of any sort and excavations can immediately begin. The process should not, however, degenerate into an aimless digging of pits; the concentration must, at first, be on the removal of the top soil stratum till any underground walls and rooms, etc., are seen in outline. The area should then be divided into a square grid, modified, if necessary, in the context of rooms sizes, etc. Everything found in a given locus (the archaeologist's name for each square or element of the grid) should be recorded both in terms of its horizontal and vertical location. Further, since the possibility of reconstructions due to successive occupations of the site always exists, the finds should be simultaneously interpreted to decide if the walls, etc., met within the upper stratums, need to be removed to reach still earlier development, if any, below them. It would be superfluous, of course, to the context to enter into a detailed statement of the archaeological processes but the crucial need to put the work, in the charge of a capable team of historians and technicians, must be stressed.

5.10. Apart from the Temple sector, another important site, eminently worthy of archaeological exploration, is the mound—obviously the remains of a large, Stupa ascribed to Emperor Ashoka—in the Bakraur sector. Some smaller mounds, south of the Temple, would also seem to have an archaeological potential in the context of Hiuen Tsiang's description of twenty-one Stupas and a number of shrines. Indeed, from the names and the elevations occupied by many of the 'tolas', it is difficult to say where such a potential ends at Bodh Gaya and finds in the future, during the excavation of trenches for utility services, may highlight other areas as well. It is, however, improbable, on the whole, that such areas would match the importance of those already pointed out.

Tourist Needs

5.11. Tourism is, and would remain an important bulwark of Bodh Gaya's economy and its active promotion must be a basic constituent of a Master Plan for the integrated development of the town. But vital as they, no doubt, are, tourist needs and facilities do not, however, begin and end with the mere provision of accommodation. The perspective must widen to include all amenities and conveniences, which would make their stay a wholly enjoyable one, and to encourage them, thereby, to linger and to return for many other visits. Viewed thus, the proposed landscape park round the Maha Bodhi and archaeological exploration; cultural, recreational and amusement facilities; a good—not necessarily large-shopping centre—catering, in addition to local needs, to tourist tastes and preferences (e.g., handicrafts including temple and Stupa models, etc., which even a fleeting visitor to Bodh Gaya would relish to carry back as a momento); conducted tours of sites hallowed by the Buddha and scenic spots in the vicinity—necessitating a more intensive development of local communications than obtaining at present—are integral parts of the same picture. Indeed, at many points tourist needs merge with the local, giving it a new tone and complexion in the process.

5.12. The importance of Bodh Gaya as a great tourist centre—in fact, the greatest centre of world Buddhist pilgrimage—has already been noted. About

6 per cent of the total town population on any normal day is composed of tourists (including pilgrims) halting in the town: the percentage rises much higher if a sizeable number of other visitors, with only a few hours to spend here, are also included. On days of special religious significance, the tourist component would easily swamp the presently small resident population. The visiting population has its origins mainly in all Asian countries with a Buddhist population, viz., Japan, Korea, Cambodia, Laos, Viet Nam, Burma, Sikkim, Nepal, India and Ceylon—the traditional flow from China has all but dried up and the Tibetan influx has now an Indian source. There is, in addition, a sprinkling from other parts of the world, for the enchanting personality and teachings of the Buddha have such a sublime and transcedental character as to attract the reverence of all mankind. The tribal folk, who move and stay in large groups, from the Himalayan region form, however, the major element in the international traffic but, regrettably, it is for this unsophisticated section—still a simple world of its own—that facilities are chiefly lacking. As a consequence, they crowd in the campus of the monasteries and rest-houses and other open spaces in the Temple sector. The provision of tourist homes for the poor classes (mainly in the form of halls furnished with plank-beds and lockers, community kitchen, water-supply and simple sanitary conveniences), together with a camping ground for larger congregations, would ameliorate their present discomfort and preserve serenity and grace in the Temple environs. These homes should be built to austere standards and the aim should be to provide—in the light of the present strength on a normal day—accommodation for about 200—300 persons on simple and hygienic lines.

5.13. The accommodation, presently available at Bodh Gaya, for tourists is listed below :—

	Rooms.	Seats
Burmese Monastery and rest-house (in northern sector).	4	8
Chinese Monastery and rest-house (in Temple sector).	8	8
Tibetan Monastery and rest-house (in Temple sector).	20	40
Maha Bodhi Society rest-house (in Temple sector).	7	12
Birla rest-house (in Temple sector)	16	48
Thai Monastery and rest-house (in south-western sector).	20	60
Total	75	176
Central Government rest-house (in Temple sector).	8	8
State Government inspection bungalow (in Temple sector).	2	4
State Government tourist dormitory (in south-western sector).	9	48
Total	19	60
Grand Total	94	236

Set in the context of a further increase due to future monasteries, and the proposed poor-tourist homes and camping ground, the accommodation would, on the whole, seem sufficient quantitatively. However, since

the daily rentals, payable for the qualitatively superior governmental accommodation, are Rs. 5 per room, Rs. 3 per room and 0.75 nP. per seat respectively in Central Government rest-house, State Government I. B. and State Government tourist dormitory and the inspection bungalow has, further, only two rooms—it would appear desirable—apart from increasing the number of rooms in a new I. B.—to introduce still cheaper accommodation for the lower middle-class tourists. A rest-house, with one and two-room flats—a modified version, so to say, of a similar provision with uniformly two-room flats at Rajgir—serving also the needs of lower categories of government servants on duty—should, therefore, be included in the programme for future action in the field of tourist accommodation. Additionally, the fullest encouragement should be given to all philanthropic activity aiming at an increase of accommodation in the form of 'Dharmashalas' (rest-houses providing free, or nearly free lodging); holiday homes and youth hostels, etc., within the framework of an envisaged planning and architectural control under the existing legislations, viz., the Bihar Restriction of Uses of Land Act and the Bihar Town Planning and Improvement Trust Act.

5.14. Coming to cultural and recreational aspects of the tourist facilities, it has already been noted that, at many points, they merge with the local needs, giving the latter a new tone and complexion in the process; naturally, the merger relates to major provisions in these spheres. In the cultural field, while the existing—as also the proposed—monasteries render important functions, they do not obviously replace the needs of such institutions as an International Research Centre, and International Languages Institute and an International Buddhist Art Gallery. The former must naturally have an excellent library—containing books, periodicals, published and unpublished researches on ancient history and culture, metaphysics and religion, anthropology and archaeology, etc.—and be located, due to the necessity of cross-references, close to the recently built museum. The International Languages Institute (to be run economically through the voluntary employment of learned resident monk-teachers) and the International Buddhist Art Gallery should also be similarly located and, from all considerations, a site behind the Thai monastery may be considered most appropriate. .

5.15. Recreational and amusement facilities are presently lacking not only for the tourists but almost the entire population. The needs of the latter would, however, be considerably provided for in the residential neighbourhoods and a major recreational sub-sector, proposed west of the Pachhati neighbourhood, integrating a number of small tanks and a larger one about a furlong in length. To conserve productive land, we envisage the provision of similar tourist facilities in this area, of about 90 acres, itself. Further, while an open air theatre, a major community centre, boating and angling facilities, parks and playing-fields would convert the sub-sector into the recreational hub of the town, economic output would still be maintained through pisciculture, fruit orchards, nurseries, etc. Together with the provision of park land and picnic spots in the sylvan environs of Bakraur as also a convenient access to it, even leisurely rambling would become an important attraction at Bodh Gaya.

Monastic Needs

5.16. Monastic needs form another important facet of a discussion of the Maha Bodhi and related needs. While it is a moot point, as to how many monasteries Bodh Gaya may ultimately come to possess, the limit definitely lies around twelve and some immediate demands are to be met. A detailed consideration made

from paragraphs 5.5 to 5.9 in this Chapter, as also elsewhere, rules out the location of any future structures in the Temple sector. The choice, therefore, lies between the northern sector (with an existing—and architecturally uninteresting—Burmese monastery) and the south-western sector, with its beautiful ensembled of the Thai monastery, Temple and rest-house, lying on the access artery from the Gaya-Grand Trunk Road link. Since, in the light of existing conditions, the former has to be planned to contain the bulk of the resident population with a consequent provision of important land uses (e. g., shopping centre, transport terminal, high school, rural industries, etc.—the first two dictating, in turn, the location of cheap rest-houses and tourist homes, camping ground, etc.) along the riverside road from Gaya town, the south-western sector would certainly provide more serene environs appropriate for monasteries. Further, as would be seen shortly, it has an intimate relationship with the proposed meditation ground—an obvious need here.

5.17. The trans-regional high tension electricity line divides the south-western sector into two principal sub-sectors. The eastern sub-sector, nearer the Maha Bodhi, contains the Thai monastery, government tourist dormitory and employees' quarters as also a library and rehabilitation colony and has, thus already acquired a complex character. Certain other cultural facilities, discussed previously, must also find a place in this sub-sector, the area of which is limited to about 63 acres due to the low lands of a catchment to its south as well as vista considerations. Since space can be found for only a few monasteries in this sub-sector, a provision for the bulk of future monasteries is only possible in the western sub-sector, where the block offices and a small youth hostel comprise the up-to-date development. As a matter of fact, the dispersal of monasteries, within the limits of an economic provision of roads and utility services, would lead to a more interesting townscape than otherwise. It must also be stressed that, through an enforcement of architectural and planning control future monasteries would have to express their national personalities in an ensemble as pleasing, if not more, as the recently built Thai monastery.

Meditation Park

5.18. The meditation park is a vital need at Bodh Gaya, but the danger is that misconceived notions may lead the enthusiasm for it to a point of physical development, where no meditation is possible. Proposals already exist in which—while the deer park, reviving memories of old Sarnath and the mango grove of Ambapali have all been included—the road system has been made to bear on a small meditation park abutting an existing centre of habitation of about 500 souls. Obviously, neither the sight of a herd of deer, nor that of a newly planted mango grove, would restore the mental concentration of a person (in this modern age) frequently disturbed by whiffs of spicy smell and sound of traffic. To put it briefly, though symbols have a natural, important and respected place in the development of Bodh Gaya, objectives would not be attained merely by their incorporation in inherently weak proposals.

5.19. The existing, as well as the envisaged, development, of this town make the southern sector an obvious location for the meditation park; due to its broken topography and a considerable area of lowlands, cultivation and orchards form the only land uses in this sector, apart from small residential uses in the Tikabigha (population 389) and Urel (population 73) tolas, and a temple and pump-house north of the former. All this existing development pushes the meditation park, if it

is to abut desirably the ancient Niranjana, south of Tikabigha, unless the latter itself is dislodged. Though, strictly from planning and, to some extent archaeological considerations, the relocation of Tikabigha and Urel—with a total population of 462 persons obviously forming a non-viable unit for a residential neighbourhood—is necessary administrative and financial difficulties rule out any such prospect in the near future. An additional perspective is introduced by the fact that the Niranjana is presently a torrent running with water only during the monsoon and, for the greater part of the year, its wide and shallow sandy bed is merely a source of sand, blown across the river-front by easterly winds, and radiated heat. Since, as we shall see later, the technical possibilities of creating a perennial water-front are costly any meditation park, abutting the river-front, should presently have a belt of plantation to shelter it from the east. Similarly, since the other prevailing wind, viz., the westerlies, would blow in dust from the fields as well as heat radiation from the west, another screen of plantation would be necessary on this side. Naturally, in focusing attention on the major climatic compulsions, there is no implication that the medifation park itself would be devoid of any plantations; on the other hand, these it must have to the fullest, so as to provide an ideal environment for sheltered and secluded meditation.

5.20. Fortunately, an excellent mango grove, stretching along the river-front for more than two furlongs, exists just south of Tikabigha and, the only choice, as it were, thus emerges as the ideal one. Together with the vacant land, lying in the bend of the channel partially skirting and traversing the southern sector, to its west, the meditation park would not only have a full view of the Maha Bodhi but can also be approached axially from it along a proposed avenue, interestingly the route of the Buddha to the court of King Muchilinda. The incorporation of the route in the proposed park area thus provides, all in all, the holiest associations appropriate to the setting. With the relic, Urel, not far, Uruvilva Vana—the ancient forest land hallowed by the Buddha's meditations—would seem to be the obvious name for this park.

5.21. Many important criteria for a satisfactory location of the meditation park—viz., climatic factors; aesthetic environs surrounded by an agricultural green belt; size; relationship to the Maha Bodhi and the river-front; and traditional significance—are thus met. As can easily be seen, its relationship to the south-western sector where, in addition to the Thai monastery future monasteries would be coming up, is also satisfactory. Its comparative proximity to Tikabigha (inevitable in any scheme based on the Maha Bodhi and the river-front) is, undoubtedly a disadvantage but is mitigated, to a very large extent, by the smallness of the neighbourhood in relation to the envisaged size of the park—about 90 acres including the existing mango grove covering about half the area—which would introduce a sufficient distance between the neighbourhood and the meditation points. Even the remaining difficulty would disappear with the integration eventually of Tikabigha, as also Urel, through suitable relocation, with the envisaged amenities and conveniences of the northern sector. But, while even seclusion from centres of habitation and congregation is, for the present overwhelmingly, and, in due course, completely secured, a further consideration has to be given to seclusion from disturbing pedestrian and vehicular traffic.

5.22. Obviously, the provision of a riverside extension, in the southern sector of the major road from Gaya town would cut across the proposed landscape park round the Maha Bodhi, as well as the meditation park,

and traffic from Mocharin and other riverside villages to the south would be drawn into them. The existing alignment of an unmetalled road, which the river has already cut into at some places, has, therefore, to be abandoned in the Temple and southern sectors, and a new road provided to their west. So far as the needs of access to the meditation park itself is concerned, they should be viewed in the context of its function, which is meditation in seclusion and not an exhibition of the flora and fauna (a botanical and zoological garden, as it were) for the general public. The crux of the problem, thus, lies in an access-pattern which, while discouraging the latter, permits those with a pre-determination for meditation to reach the park. Admittedly the solution is not an easy one and the best, that can be done, would be to provide two unmetalled paths, lined with shady trees, linking the meditation park to the Maha Bodhi and the new road proposed above.

5.23. We have now reached the stage where the internal development of the meditation park can be profitably discussed. The mango grove, as a symbol, already exists and it would be pointless to repeat it; the deer park—unless all that is desired is to attract the inevitable crowd, either in or near the meditation park by showing a herd of deer in striking captivity (indeed the very anti-thesis of the Buddha's teachings)—requires an adequate size and should not be introduced in it. Symbols, most appropriate to the context, are obviously the Pipal tree and the wheel (of the Law); the effect can become, however, highlighted only if repetition—at least in close proximity—is avoided. The meditation park should have a fringe of tall and spreading trees all round, about 3-4 rows deep, sheltering a number of small meditational groves ('Kunj') informally distributed around pools and approached by winding tracks. Further, as one saunters along the two shady access-avenues towards the park, rock (and other) carvings and inscriptions, based on the life and teachings of the Buddha, should elevate the mind to a higher plane and prepare it for meditation.

The Deer Park

5.24. An ideal and richly sanctified site for the deer park can be obtained through the afforestation of the ancient Dharmaranya ('dharma' or holy forest), presently, a sandy stretch in the Bakraur sector. Closer to the Maha Bodhi, a symbolic expression can be provided, if only low growing trees are planted so as to keep the Temple vista unobstructed, more prominently opposite the Thai monastery and the tourist dormitory, in the land occupied by the inappropriatedly located high school, State seed multiplication farm and the Miabigha neighbourhood of only 157 persons. The development of the large roadside tank in this area should, further, enable the passerby to have an exhilarating experience from the site of the deer on the water-front.

CULTURAL, EDUCATIONAL AND RECREATIONAL FACILITIES

6.1. A discussion has been made, in the preceding Chapter, of the many points of contact of the tourist and local needs; the former have also been studied in detail. The scope of the present Chapter is accordingly related to local—in other words, the resident population—needs. The provisions, already suggested in the other category, would be mentioned here, so as to give an integrated and complete picture.

Cultural Facilities

6.2. Culture is a vast word and, while, on the one hand, a number of cultural facilities may exist in a town without making an impact on its people, some intimate ones may get ignored, on the other hand by a town planner more concerned with the ritual than the philosophy of his profession. Primarily, it is only the provisions, in the context of the existing socio-economic background, age-structure and literacy standards, which have a popular meaning and, consequently, utilisation. Though the context is slowly changing in the developing economy of our Welfare State, the Indian Society, taken as a whole, would never become the image of its western counterpart. The euphemistic 'community centre ' of normal town planning parlance and practice would, thus, at best serve a section of the adult male population and—unless the cultural facilities for the female are to be ignored—a more realistic approach is required.

6.3. Lewis Mumford, whose contribution to modern town planning though is unparalleled for its social base and breadth of vision, sees the school ' as an environment modified for biological and social development of the community' and adds, 'Today the school has another task; that of making the community as a whole capable of controlling its destinies; capable of disciplining and making over every aspect of its activities, the practical and the instrumental,' the personal and the communal. A large order : it puts the school in the central position occupied by the church in mediaeval Christendom.....The institutions that are necessary, as it were, to the school are the public library and reading room, public workshops, studios, and laboratories, and public dance-halls and little theatres..... Most neighbourhoods, even little public housing has been achieved, lack more than the most rudimentary physical facilities of a good social life;' (Mumford : The Culture of Cities, pp. 476-77).

6.4. Naturally, what is important is the spirit, rather than the details, which would vary from one civilisation to the other, of the above observation. At Bodh Gaya, where we have already noted the poor female literacy of 8 per cent and the male literacy of 48.3 per cent (somewhat artificial due to the bulk of literate institutional population entering in it), the school should desirably render greater functions than the mere teaching of lessons to particular age-groups. Such an approach would not only save costs but also extend the cultural, educational and recreational facilities in a convenient manner to all age and sex-groups. Thus, if the infant school for the age-group 3 plus to 5 plus—envisaged as the focus of each housing area in a neighbourhood—is also made the seat of the above facilities for the adult female population, social realities would be met and the provision would attain both popular meaning and utilisation. Similarly, the junior school campus—a focus for the whole neighbourhood as an educational seat for the age-group 6 plus to 10 plus—may be further visualised as a community-centre for the adult male population after school hours. Together with the apex community-centre in the major recreational sub-sector already outlined (as also an International Buddhist Art Gallery, etc.) in relation to tourist needs, the above provisions would, on the whole, be sufficient in the field of cultural facilities. Presently, apart from the Museum in the Temple sector, the library in the south-western sector and some less direct cultural functions rendered by the monasteries—cultural facilities are confined to a small library in Rajapur tola, devotional meets at some tola-temples and folk-singing in small open spaces near the habitations.

Educational Facilities

6.5. Bodh Gaya raises certain special issues—not common to a town of its size—due to its selection as the site for the Magadha University. In paragraphs 5.2 and 5.3 of the previous Chapter, we have already discussed its proper location in the context of the Temple vista and other issues involved and, accordingly, suggested the sites for the staff residential quarters, farm and major playing-fields on the eastern side of the link road and for the remaining requirements (e.g., hostels and teaching blocks senate, etc.) on its west. Within this framework, it would obviously be desirable to give the teaching blocks area an intermediate location between the students' hostels and the staff residential areas; a symbolic expression can also be included by putting the senate-complex axially to the Maha Bodhi, two miles away. The introduction of major playing-field opposite the teaching blocks, and between the staff residential area and the access artery from the link road, would further make a related utilisation of the lands which would otherwise lie in the green belt from Temple-vista considerations. The same considerations, as also a proper utilisation of the balance of donated land, put the university farm to the south of the staff residential area in an ideal relationship with it. On the whole, an area of about 320 acres is thus brought within the ambit of the university development, as tabulated below :—

	Acres.
Western sub-sector (senate complex; teaching and ancillary units; students' hostels, minor play-grounds and stadium).	150
Eastern sub-sector (staff residential area of approximate 60 acres; major playing-fields and farm).	170
Total University sector (approx.) ...	320

6.6. The University as also the proposed International Research Centre and the International Language Institute, would, however, be a facility at the apex level. Educational facilities for children have to be provided in various categories of schools with adequate accommodation, playing-fields and equipment. Presently, the town has a student population of 1,100, which works out to about 20 per cent of its non-institutional population as against 39 per cent falling in the age-group 3 plus to 16 plus. Even for this student population, as the following table shows, very little organised provisions exist :—

Sector and non-inst. population.	Category and tola location.	Number of students.	Number of classes.	Other information.
Northern (1971).	Lower Primary School, Rajapur.	40	3	Functions in a temple with one teacher and no recreational equipments.

Sector and non-inst. population.	Category and tola location.	Number of students.	Number of classes.	Other information.
Temple (1791).	Upper Primary School, Bodh Gaya Bazar.	218	5	Functions in a *kutcha* building of the P.H.E.D. with six teachers and no recreational equipments.
	Girls' Upper Primary School, Bodh Gaya, Bodh Gaya Bazar.	104	5	Functions in Jagannath Temple with three teachers and no recreational equipments.
	Sanskrit Vidyalaya, Bodh Gaya Bazar.	40	8	A special category school functions in its own two storeyed *pucca* building without campus.
North-Western (775).	Bodh Maha Vidyalaya High School.	511	11	Functions in a *pucca* single storeyed building (and a recent *kutcha* addition) belonging to Mr. Birla has 14 teachers and some recreational facility. Is sandwiched between road and large tank.
	Lower Primary School, Bhagwanpur.	37	3	Functions in a private building with one teacher and no recreational equipments.
	Upper Primary School, Baijubigha.	115	5	Functions in its own building with two teachers. Has 1/16 acre land and no recreational facility.
South-Western (514).	Harijan Lower Primary School, Pipalpati.	36	3	Functions in a temple with one teacher and no recreational equipments.

6.7. Apart from the general absence of suitable provisions, an analysis of the above throws up some other important facets. The present educational facilities are seen to relate a 11-year period normally falling in the age-group 6 plus to 16 plus only and nursery-infant schools for the lower age-groups do not exist. Further, while the average number of students per class in the three lower primary schools broadly corresponding to the age-group 6 plus to 8 plus is 13, the same figure works out to 29 in the three upper primary schools covering, more or less, the age-groups 6 plus to 10 plus and, 46 in the high school for the age-group 6 plus to 16 plus. The emergence of a specific girls' school at the upper primary level also indicates a degree of social preference for separate provisions from the age 9 plus onwards, which, as seen from the sharp divergence of the averages of the lower and upper primary schools, would seem to be the point where schooling presently begins to be seriously attended to.

6.8. The pattern of proposals for placing the educational facilities on an adequate and organised basis would naturally differ with the age-limit for co-education. Since the weight of social preference at this town, with an overwhelmingly rural background, has led to the utilisation of existing overall facilities only to the extent of returning a female literacy figure of 8 per cent, it would obviously be desirable, so far as at least the near future is concerned, to accept the realities of the situation and provide the much needed fillip to female education here. Our suggestion to make the nursery-infant school campus the focus of each of the 3 to 4 housing areas in a neighbourhood—additionally the seat of adult female cultural, educational and recreational facilities has kept this in mind. A co-educational lower primary (or junior) school for approximately the age-group 6 plus to 8 plus now, further, becomes the focal point, where cultural facilities, etc., for a neighbourhood population would also be gathered, of the neighbourhood as a whole and, in the context of a modestly desirable size of about 2,000—2,500 for the latter here, each such school should have about 150—200 students on the roll. The remaining educational needs for the age-group 9 plus to 16 plus then fall within the ambit of separate secondary (9 plus to 14 plus) schools, at least two of which should obviously have higher secondary (9 plus to 16 plus) educational facilities. It should also be borne in mind that the latter schools would have a larger catchment area than the administrative limits of the town itself.

6.9. A projection, on the basis of the existing age structure, gives the following picture :—

Age-group.	Percentage of total non-inst. population.	Total no. at present.	Total no. in 1981.	Total no. with maximum population (excluding university and other inst. population).
3 plus to 5 plus	7.7	424	539	1,001
6 plus to 8 plus	7.7	424	539	1,001
9 plus to 14 plus	16.1	888	1,127	2,093
15 plus to 16 plus	6.5	358	455	845

In the light of the preceding discussion, a provision of 9—12 nursery-infant schools, 3 lower primary (junior) schools, 1 secondary and 1 higher secondary schools each separately for boys and girls would therefore seem sufficient for the town's needs till 1981. Admittedly, the age structure may modify itself over a long period of planning but the dimensions of such fluctuations are usually small and a little elasticity in the strength of each school can take care of them.

Further, the remoteness of the stage of maximum population makes only a general appreciation, rather than a detailed provision, at present, necessary. The requirements, however, as is seen, get doubled

6.10. Since, in the context of existing development as well as overall needs, the northern sector would be containing the bulk of the town population, the above educational facilities would have to be located largely within it; even the balance must have a convenient relationship to it. Another important locational consideration is the need to safeguard the serenity-areas (viz., the Temple sector, meditation park, monasteries, etc.), particularly from the inevitable disturbance from higher category boys' schools. Economic factors, further, make it desirable to make a more intensive utilisation of the envisaged major recreational sub-sector through the introduction of some higher category schools, which would cause the minimum disturbance, in it, e.g., a girls' higher secondary school and a boys' secondary school separated by the proposed major community-centre. In the summation, therefore, apart from the above two schools, desirable locations for the boys' higher secondary school and the girls' secondary school are found east and west respectively of the Dehariabigha-Upadhyayabigha-Rajapur-Sonubigha group of tolas (the Rajapur sub-sector so to say) and for the lower primary (junior) neighbourhood schools in Upadhyayabigha, Pachhati and south-western sector; the nursery-infant schools of our enlarged conception would naturally go to each housing area (of about 500 persons) within the neighbourhoods. Conceivably, a Madrassa may also be required but it does not obviously alter the basic pattern outlined above.

Recreational Facilities

6.11. To a great extent, the intimate inter-relationship of recreation with cultural and educational facilities has already resulted in their discussion in unison. The nursery-infant school campus has additionally emerged as the focus of the adult female cultural, educational and recreational facilities in each housing area, just as the lower primary school campus that of the neighbourhood as a whole; the age-group 9 plus to 16 plus (particularly its boy's component) would have its recreational facilities centred naturally in their educational institutions. It must, of course, be remembered that recreational facilities have both active and passive aspects and outdoor, as well as indoor, requirements varying with different age and sex-groups. Apart from the above provisions, a major recreational sub-sector, with a major community centre and open air theatre, has further become an integral part of our proposals and, together with neighbourhood and other parts—as also the ready accessibility to the green belt—the proposed recreational facilities acquire an overall sufficiency. It is difficult to imagine a cinema house in the scheme of these facilities at Bodh Gaya (though a film society may be established to screen good films in the open air theatre) but, in any case, the nearly town of Gaya amply serves this need.

BUSINESS AND COMMERCIAL FACILITIES

7.1. Business and commercial facilities are vital to the convenience of living for any community. At Bodh Gaya, constituting, as they do, another significant point of contract between tourist and local needs, their location and quality become part and parcel of the overall image of the town in the departing tourist's

mind. Other important aspects arise out of the necessity, already discussed in detail, of removing the maximum possible unrelated land uses from the Temple sector for enhancing its serenity and aesthetic beauty, and of recovering rich archaeological areas for exploration. This otherwise mundane—and conceivably minor, to most people—subject merits, therefore, an examination at a greater length than what would normally be necessary for another town with a comparable population.

Business Facilities

7.2. The existing business facilities at Bodh Gaya are wholly comprised of government and related offices, viz., the block development office; the police-station; the post and telegraph and public health engineering department offices; and those of the electricity board, Temple management and panchayat (village self-government). In the coming future, a modest increase in them with the establishment of town administration, tourist, co-operative societies and some other government offices may also be envisaged. Perhaps, even banking facilities may enter the picture at a suitable stage of town growth. All the same the proximity of the major district town of Gaya is bound to give the total content of business facilities at Bodh Gaya a small dimension and, as a consequence, it is only through a compact grouping that scale, colour and convenience can be infused in them. It would, therefore, be desirable to strengthen the block development office-area—the principal local-regional office having, further, a good location in the south-western sector—into a business precinct by directing more government and suitable related offices (excluding the intrinsically noisy ones with workshops and material stores) in it. The latter, as also other remaining offices, should be fitted into a business-*cum*-commercial precinct for which the Pachhati sub-sector of the northern sector would provide both an obvious and convenient location. An additional facet here is presented by the need of suitable non-residential development along the northern fringe of the proposed circular road (the Temple by-pass). We may further add that the planned approach, outlined above, would also facilitate the integration of the residential needs of employees in organised neighbourhoods.

7.3. With the above context—and others highlighted by the need of a removal of unrelated land uses from the Temple sector for enhancing its serenity and aesthetic beauty and of a recovery of rich archaeological areas for exploration—the relocation of the public health engineering department, Temple management and tourist offices (all situated on the archaeological mound itself); the post and telegraph and electricity board offices (in the strip of commercial area between the Math and the mound) and the police-station (at the foot of the mound and to the north-east of the Temple) has to be actively considered. The existing insufficient and inappropriately located strip of commercial area would eventually disappear with its incorporation in the proposed landscape park round the Maha Bodhi but governmental activity, which must be in the lead if the envisaged development of the town, befitting its international and tourist importance, is to fructify, should obviously precede this as other eventualities.

7.4. Bodh Gaya certainly needs a better post and telegraph office than its present old and outmoded premises in an insanitary area and a new one, in keeping with other laudable architectural creations, e.g., the rest-house and the museum here of the Government of India, should, therefore, soon come into existence.

Desirably, while the main office should be located in the block office business-precinct, branch facilities should be made available in the Pachhati business-*cum*-commercial precinct. The former would also provide suitable relocation sites for the police-station (another local regional office), main tourist centre, the town and temple management offices, and the latter for the electricity board (presently functioning in a rented building) and the P. H. E. D. offices. Even if financial considerations creep in, the rationalisation can still be secured through a short-term utilisation of the vacated premises for infant and junior schools; cheap holiday homes for lower categories of government servants, etc.—the police-station buildings may, further, from their location close to the Panchhati precinct, provide temporary accommodation for the P. H. E. D. and other construction offices. All these structures should however, disappear with the termination of their book value—if not earlier—which would be very small even today.

Commercial Facilities

7.5. In the context of the nearby major town of Gaya, commercial activity at Bodh Gaya is bound to have a modest character but exhibits, all the same, a remarkability in terms of the number pattern, and trend of growth of shops. In Britain, the urban average is one shop for 40—70 persons—the rural average being naturally still higher; the local average of one shop for about 50 persons, is thus, under Indian and particularly local economic conditions, an obvious pointer to the town's functions as a small local-regional service centre and tourist town. However, both locationally as well as qualitatively, the main shopping facilities presently merit a very poor rating and, in discussing tourist needs, we have already referred to the desirability of establishing a good, though not necessarily large, shopping centre here. Stress has, further, been laid on the necessity of a removal of unrelated land uses from the Temple sector to enable archaeological excavations and landscape treatment. The present ribbon of shopping area, at the edge of the mound and to the east (viz., the riverside) of the Maha Bodhi, is cramped for space and has already begun to objectionably creep up to the sacred precincts. Since the longer it occupies its present site, the greater would be the difficulties encountered in its relocation, an overall urgency attaches to the construction of a new shopping centre to accommodate the present as well as future needs of expansion.

7.6. Both existing and envisaged town-development and distribution of population highlight the Pachhati sub-sector—in which some business offices have been earlier proposed—of the northern sector as an ideal location for the above centre, really a business-*cum*-shopping precinct in the overall context, bounded by the axial road of the sector on the north; the new circular road (the Temple by-pass) on the south; the riverside road on the east and residential development on the west. Since the bulk of traffic enters Bodh Gaya along the shorter route of the riverside road, a further prominence would be gained for the precinct by the integration of the main vehicle park and transport terminal, as also the establishment nearby of future tourist homes and camping ground, etc. The Bakraur link-road, envisaged as an extension of the Temple by-pass, and the elimination of vehicular traffic past the Maha Bodhi due to the abandonment of the existing P. W. D. road alignment after the by-pass and some other proposals crystallise, would also lead to an isolation of the present shopping area and bring the proposed precinct into the sharpest focus.

7.7. Including commercial activities in the ' tolas ' (rural neighbourhoods) and open-ground vendors selling vegetables, fruits, curios, etc., the town has today about 125 shops and stall, the overwhelming bulk of which is, naturally, concentrated in the Bazar, viz., the main shopping area. Since neighbourhood shops would exist in suitable number even in the envisaged town-development, of concern to us here are the 90 shops and stall and some 20 open-ground vendors in the latter, occupying a carpet area of about 51,000 square feet or, in other words, a built-up area (including walls) of about 60,000 square feet. Approximately half the number of shops and stalls have small dwellings attached to them and about the same percentage falls in the durable and moderately durable categories. In the context of poor specifications of construction generally, the overall costs of acquisition and clearance of the main shopping area (including dwellings) should have, with realistic valuation-methods, a small dimension not exceeding Rs. 2,00,000 and chargeable to improvement works at the Maha Bodhi precincts.

7.8. The distribution of existing facilities in the main shopping area is given below :—

Type of shop.	Number.	Percentage of total no. of shops.	Carpet area in sq. ft.	Percentage of total carpet area of shops.
Groceries ..	14	12.7	9,602	18.8
General merchandise.	15	17.6	9,507	18.6
Cloth ..	11	10.0	7,963	15.6
Medicine ..	3	2.7	2,243	4.4
Coal ..	1	1	1,071	2.1
Foot-wear ..	1	1	150	0.3
Cycle-repair ..	3	2.7	420	0.8
Tailoring ..	5	4.5	1,718	3.4
Cheap refreshment.	18	16.4	11,349	22.2
Pan and tobacco. etc.	8	7.2	2,086	4.1
Hair-cutting ..	4	3.6	853	1.7
Gold and silversmith.	5	4.5	1,090	2.1
Books ..	1	1	336	0.8
Flour mill ..	1	1	1,071	2.1
Open-ground Vendors.	20	18.2	221	0.4
TOTAL ..	110	100	51,000	100

Certain shortcomings such as, good hotels and emporia, etc., are thus rendered obvious. It is important to note, however, that the present unplanned shopping area is wasteful in terms of horizontal space due to a general absence of vertical storage and display facilities and, with proper design, it should be possible to meet overall needs for the coming twenty years within a carpet area of about 40,000 or, in other words, a built-up area of about 50,000 square feet.

7.9. A further analysis, according to the area occupied by each shop, is provided by the following table :—

Area of shop (sq. ft.).		Number of shops.	Percentage of total.
50—100	..	6	6.7
101—150	..	16	17.8
151—250	..	10	11.1
251—350	..	15	16.7
351—450	..	12	13.3
451—550	..	9	10.0
551—650	..	1	1.1
651—750	..	5	5.6
751—1,000	..	3	3.3
1,001—1,250	..	4	4.4
1,251—1,500	..	1	1.1
1,501 - 1,750	..	1	1.1
1,751—2,000	..	3	3.3
2,001 2,250	..	1	1.1
2,251—2,500	..	..	..
2,501—2,750	..	1	1.1
2,751—3,000	..	2	2.2
3,001—3,500	..	..	..
3,501—3,750	..	1	1.1
Over 3,750	..		..
TOTAL	..	90	100

The pattern shows that 90% of the shops (excluding open-ground vendors) have, each, a carpet area of less than 1,250 sq. ft. and even within this range, only 15% have a carpet area exceeding 550 sq. ft. It may therefore be advantageous to repeat bays of approximately $7\frac{1}{2} \times 20$ feet and to suitably partition them to meet individual requirement-ranges.

7.10. The utilisation of the above data would help in the evolution of a rational and realistic design for the new shopping precinct on the basis of the existing type and areawise distribution of shops, both of which are the products of solid economic realities. Naturally, minor variations—the realm of which has also been indicated—may not only be desirable but are necessary to introduce a measure of elasticity to meet current shortcomings and future economic trends. Precinctual planning, of which the sector shopping precincts of Chandigarh are a good example, should further enable us to maintain aesthetic and hygienic conditions as well as convenience in shopping, by fringing quality shopping the front while shops and stalls selling groceries, cheap refreshments, vegetables, etc., are grouped in an inward-facing quadrangle. It is necessary, however, to emphasise that a perversity of architectural form should not be permitted and any schemes making the shopping centre appear as a temple precinct should be unhesitatingly rejected. While motifs and symbols, as also an aesthetic landscape-treatment are to be welcomed, they should have a subdued character within an overall design reflecting strongly commercial functions and activity, good architectural taste and public convenience.

COMMUNICATIONS

8.1. Communications at any town have three facets: regional, local-regional and local. The first two facets involve the town's links with the remote and the intimate world, respectively, of its contacts while the last facet is concerned with the convenience of circulation within and between various parts of the town itself. An integrated urban road system is the result of an appropriate co-ordination of all of them.

Regional Communications

8.2. As has already been mentioned, regional rail and road communications—apart from the Grand Trunk Road, the important Delhi-Calcutta national highway—converge from all sides, on the town of Gaya which thus forms the principal gateway to Bodh Gaya. The Gaya-Dobhi Road—of a formation width of about 32 feet and a total right of way of about 180 feet—provides Gaya's link with the Grand Trunk Road running about 20 miles to the south of it. While the formation width is presently ample, the increasing traffic along this important regional route makes it necessary to keep its widening in mind, as also the removal of the bottle-necks of a narrow bridge on the Falgu and a congested passage through some parts of Gaya. The Master Plan for the town of Gaya naturally is concerned, among other things, with a solution of these problems.

8.3. Topographical limitations, such as the Brahmayoni hill and existing development in and around Gaya, preclude the development of a nearer rail-head for Bodh Gaya without incurring heavy costs. Perhaps, from overall considerations, it would not even be desirable to seek an extension of the railway line to this town. Further, though a big civil aviation aerodrome is situated off the fifth mile of the Gaya-Dobhi Road, it does not presently fall on the route of any scheduled flights of the Indian Airlines Corporation. The nearest service aerodrome lies at the State capital town of Patna, about 70 miles away, but chartered flights can land at the Gaya aerodrome itself. On the whole, therefore, regional communications here have a fairly established and broadly satisfactory character and it is not necessary to make any provisions for them in a Master Plan for Bodh Gaya.

Local-regional Communications

8.4. Though a number of rural footpaths and cart-tracks, some over the sandy bed of the Niranjana, link this block-administrative town and service centre with the surrounding villages, etc., the principal local-regional roads at Bodh Gaya are the access artery from the eighth mile of the Gaya-Dobhi Road and the river-side road from Gaya. The latter further runs on, as a *katcha* track now partly over the river-bed due to erosion, to the Grand Trunk Road and provides an approach to the riverside villages such as, Mocharin, etc., south of Bodh Gaya. The proposed Bakraur-link (as also its subsequent extension to Praglodhi hill and the Gaya-Nawada Road) would become another important local regional road when the scheme materialises.

8.5. In course of time, both the access artery from the Gaya-Dobhi Road as also the riverside road from Gaya are visualised as dual-carriageway roads with ample pedestrian strips, a varied plantation of shady and flowering trees, and monoliths and other sculptures in the central verge at regular intervals. A priority, however, attaches to a realignment of the former within the Temple sector through the development of the Temple by-pass and to the further improvement of the riverside road, which serves as the shorter and the principal traffic route. As against a minimum right of way (excluding

borrow-pits to be eliminated within town limits) of about 80 feet needed by the envisaged form of these two roads, the access artery presently has a formation width of about 24 feet and a total right of way (inclusive of borrow-pit reservations) of about 80 feet, the corresponding figures for the riverside road being about 24 feet and 50 feet. It is also necessary to realign the southern extension, presently a broken *katcha* track, of the latter along the western periphery of the Temple sector so as to give it an improved location within town limits and to eliminate all vehicular and other unrelated traffic from the Temple and southern sectors. Desirably a strip of 60 feet should be reserved for this purpose.

8.6. The Bakraur-link involves a critical decision pertaining to the most appropriate structure for crossing the Niranjana, north of the Maha Bodhi, coupled as the problem is with that of a, more or less, perennial water-front here. The Niranjana has a width of about 1,150 feet at a point about a mile south of the Maha Bodhi and almost due east of the Mocharin tank, after which it has—principally due to a progressive erosion of the Bodh Gaya banks over the ages—more or less stabilised itself in a width of about 2,000 feet and a shallow depth of about 3-5 feet. Its cross-sectional area and gradient are adequate to discharge normal floods without spill but the torrential nature of the stream leads occasionally to an overtopping of the banks. While a detention of such floods through irrigation works some miles upstream of the town would materially moderate their intensity at Bodh Gaya, a further protection needs to be ensured through an embankment at the town itself.

8.7. It would, of course, be useless to establish a crossing upstream at Mocharin, in the context, apart from the distance involved and the logical alignment of the proposed road to archaeologically and traditionally important sites in Bakraur, of the need of creating a water-front through storage works to be naturally located downstream of the Maha Bodhi. A high-level bridge at any site is obviously no answer to the overall problem and the same may be said of a causeway, which would additionally entail the deposit of a large quantity of coarse sand carried by the flood discharge of the river. The latter contingency would, however, be substantially reduced with the detention, as indicated above, of the Niranjana floods.

8.8. It is also to be noted that the required provisions for annual evaporation and high absorption through sandy soil, as also afflux and silt deposit, of at least 10—12 feet under local conditions, make a substantial increase in the present depth of the Niranjana an inescapable necessity. In other words, its present width of about 2,000 feet at Bodh Gaya has to be adequately reduced so that a greater depth is attained by it through normal scouraction. Interestingly enough, the considerably smaller width of the river about a mile upstream itself suggests such a river-training programme as part and parcel of any engineering works across it to attain our overall objective. All in all, it would not only be the most economical solution, when viewed against the cost of flood protection schemes and a longer structure over the full width of the river, but the consequent reclamation of land along Bodh Gaya's banks would, apart from ensuring additional protection upto the Maha Bodhi and the town, further release many interesting and aesthetic possibilities of afforestation, etc.

8.9. In the light of the total perspective outlined above, the initial phase of the Bakraur-link and water-front scheme obviously comprises of river-training and stabilisation of the reclaimed land through afforestation. In addition to reclamation works such as, spurs, etc., on the Bodh Gaya bank, stone-pitching of the Bakraur bank would be integral parts of this phase of the scheme

—aiming at the reduction the Niranjana's width to that obtaining at Mocharin, viz., about 1,150 feet, if not even less. The second phase would involve the construction of a barrage, carrying a road-decking, over the reduced river-width, and of related roads. The total cost of the scheme would be of the order of Rs. 10,00,000 to Rs. 12,00,000 as against a higher outlay of about Rs. 20,00,000 required for a high level bridge at the site.

Local Roads

8.10. Coming now to the aspect of local roads, required for convenience of circulation within and various parts of the town, they can presently be hardly said to exist; the local-regional roads outlined above, two ill-defined lanes serving Taridih (in the Temple sector) and the northern sector tolas, and a few access lanes to the scattered tolas elsewhere comprise, indeed, the entire communication system here. In developing, however, a rational road grid for the town, it is important to realise that the bulk of the traffic would always largely have a pedestrian character and the major share of the vehicular traffic would be taken by cycles, rickshaws, and carts carrying farm-produce; the latter would also require waiting ways for loading and unloading operations. For an economic and functional design, we would, therefore, recommend that, while the major local roads may have a right-of-way of 40—60 feet with tree plantation on both sides, the minor roads (serving dwellings) should not exceed 30 feet in right-of-way and have unequal flanks with tree plantation, on the southern or western side as the case may be, along only the wider flank. Further, in view of the ready availability of sand, much of the local road development should be effected through soil-stabilisation, rather than through costlier forms of construction having little relevance to local traffic needs and characteristics.

8.11. The above suggestions have, naturally, the town-proper, rather than the university sector, in view though paucity of funds even for the latter imparts them a certain overall character. Excluding the university sector, local roads are needed here to develop the northern, south-western, Temple and southern sector in an integrated and functional manner. A detailed discussion in the Chapter on 'Maha Bodhi and Related Needs' has already focused the necessity of providing only pedestrian avenues in the last two sectors and, apart from minor pathways in the proposed parks, viz., the Maha Bodhi landscape and the meditation, about 12,000 feet of such avenues and 1,700 feet of metalled vehicular cul-de-sac are envisaged therein with widths of 40 feet and 60 feet respectively. Local roads in these sectors, thus, occupy only 4.5% of the total area of about 300 acres. The northern and the south-western sectors would, however, need in view of their residential (and other) character, a more intensive development of the circulation-grid.

8.12. The former envisaged to contain the bulk of town population in its sector area of about 410 acres, would have about 30,000 feet of major local roads of an average width of 50 feet—in other words, an area of about 35 acres; approximately the same area would be required under minors to develop fully the housing areas. About 17% of the sector area would, thus, be covered by local roads. While about 15% of the area of about 190 acres of the south-western sector would be similarly taken up. It would have—in view of the concentration of monastic, public and semi-public land uses in this area—relatively a smaller amount of minors. The latter would need here about a third of the area of about 19 acres occupied by major local roads of an average width of 50 feet totalling some 18,500 feet.

The percentage of local roads in this sector, thus, works out to 15 of the total sector area.

8.13. In closing a discussion of this aspect, it may aptly be pointed out that town development, as also its concomitant communication facilities, would obviously be undertaken stage by stage. In the coming future, therefore, only the local regional roads and local roads in the Temple, southern and south-western sectors and in the Rajapur, Pachhati and recreational sub-sectors of the northern sector mainly engage our attention. Further, while the expenditure on the local regional roads would naturally be borne by the P. W. D. (the access artery from the G. T. link-road and the riverside road under its charge), the District Board and the Irrigation (Waterways) Department (for the Bakraur-link and the re-aligned *kutcha* riverside track south of the Maha Bodhi), the bulk of the local roads should be developed as soil-stabilised roads and gradually improved, in relation to need, only after a suitable development authority has been established and taken firm roots.

HEALTH AND UTILITY SERVICES, FLOODS AND STORM DRAINAGE

9.1. Environmental hygiene and medical facilities are vital constituents of a wholesome and satisfying community life. This chapter is accordingly devoted to an analysis of the existing background, its deficiencies and requirements in this field.

Health Services

9.2. The proximity of the major district headquarter town of Gaya effects, as we have seen, the planning for Bodh Gaya in many ways. In the field of health services also, the major provisions would naturally continue to be centred at the larger town though, conceivably, the location of a university at Bodh Gaya may, in course of time, introduce crucial modifications. All the same, the need for such facilities on a smaller scale in the Bodh Gaya town-proper would, obviously, persist in the context of its envisaged population and importance. These facilities would, further, need to be grouped and placed in a quiet area fringing the green belt; it would be wrong, though the point is often overlooked, to place them side by side with commercial precincts or major educational institutions.

9.3. Bodh Gaya presently has a hospital, more precisely a dispensary with a couple of indoor bed facilities, sitting atop, together with its staff quarters, the archaeological mound area, and occupying an area of about 2.5 acres. Quite apart from the need of a further development of the health services with functionally and architecturally superior structures and equipment, the present hospital needs to be shifted elsewhere for promoting the higher demands of the Maha Bodhi and archaeological excavations. It would be superfluous to repeat here the detailed discussion on the removal of unrelated land uses in the Chapter on 'Maha Bodhi and Related Needs'. But the point would seem fairly obvious to those endowed with a cultural, historical and spiritual sense. We may also add that the present buildings have too ordinary a character to make financial considerations assume a serious aspect.

9.4. A reference has already been made of the factors governing a desirable site for the integrated health facilities, viz., a small 10-bedded hospital with an out-patients section and maternity, children welfare and health centres. From overall considerations, an

area behind the proposed 'quiet' offices-precinct in the south-western sector seems suitable for the above purpose. This location would, further, assist the integration of staff-residential facilities with those pertaining to other offices, etc. Though we have come across some rare sentimental objections to the proposed site, in the context of its proximity to the envisaged higher-category housing area to the west, it would be unwise, on their account, to relegate health services to an improper and inconvenient location. Interestingly enough, even these objections disappear with the suggestion of green verge with tree plantation all round the health precincts, and an adequate realisation of the intrinsically small scale of the involved services and consequently structures, equipment and traffic. The related built-up area would not exceed about a quarter of an acre and a 3—5-acre site would take care of all contingencies.

Water-Supply

9.5. Piped water-supply came to Bodh Gaya at an overall expenditure on it of Rs. 3.15,000 under the 'Rural Water-Supply and Sanitation Programme' of the Government of India on the occasion of the 2500th anniversary of the Maha Parinirvana of the Buddha celebrated in 1956. Two 15"/12" tube-wells, each with a tested yield of 30,000 gallons per hour, were sunk at the edge of the Niranjana in the Bodh Gaya and Tikabigha tolas but, in the light of a modest demand, their vertical turbine pumps have each an installed capacity of 15,000 gallons per hour against a head of 132 feet. Rising mains of 6" diameter from these pumps meet in a 8" diameter main which goes to feed the R. C. C. tower with a capacity of 50,000 gallons and a draw-level of 50 feet. Distribution mains from it, covering in all about 4 miles, run along the whole length of the access artery (from the G. T. link-road); part of the length of the riverside road; lanes serving Taridih, northern sector, Bhagwanpur and Bhumtoli neighbourhoods, as also the hospital and other development in the Temple sector and resettlement and government employees' colonies, etc., in the south-western sector. Internal water-supply is, however, presently a feature of mostly institutional buildings while the tolas receive piped water from road-taps, a couple of which also serve campers.

9.6. Community taps (as also latrines), however, create the worst unhygienic conditions but, though all responsible opinion is strongly against such provisions in residential areas and roadside land, the position would but slowly change in the context of Bodh Gaya's depressed economy and rural background, unless State subsidy is forthcoming, as in the case of individual latrines, to assist in the capital costs of internal fittings for most of the dwellings. It is also to be noted that, while community taps (and latrines) are economical in terms of the outlay on the distribution (and collection) system, they preclude the levy of any municipal charges on such account so as to make the services a self-supporting entity, as far as possible. Since the total subsidies would be small, due to the overall figure of about 900 buildings here not all of which would require assistance, and, apart from making the above levy possible, would further promote environmental hygiene, their adoption is to be strongly recommended.

9.7. Coming to an analysis of future requirements, it is seen from para. 9.5 that with a phased working of about 8 hours, its two tube-wells and pumps give the town's water-supply system a present capacity of

2,40,000 gallons, which can be doubled if a fresh set of pumps is installed to synchronise with the higher capacity of the tube-wells. We should note, however, that, in addition to normal increases due to the progressive growth of the resident and tourist population, large demands would arise in the future from the university sector, and watering and other needs of the Maha Bodhi in landscape, meditation, deer parks, etc., as also of kitchen and other gardens attached to buildings, the total demand on their score would be of the order of 2,50,000—3,00,000 gallons daily. The normal needs of the remaining (non-university) population, envisaged around 9,000 persons in 1981, would require an additional provision of about 2.70,000 gallons which would appreciate to 4,50,000 gallons when the town reaches the stage of the maximum population of about 20.000 souls. Bodh Gaya's water-supply should, therefore, have an ultimate capacity of 7,00,000—7,50,000 gallons daily though for a long time to come, a mere change of the existing capacity of the pumps would suffice by doubling the present capacity. The latter would be further augmented by taking over the small irrigation tube-well, falling in the present government farm or the proposed deer park area, to meet partially the watering needs. The irrigation needs of cultivation in the green belt would, of course, require an independent provision through improvements in existing rain-water storage tanks, distributaries, well, etc., and creation of more lift-irrigation facilities within the framework of an overall programme of economic betterment.

9.8. The suggested augmentation of the intake. through a change of pumps and a take-over of the farm tube-well may cost about Rs. 75,000 which would further reduce if the depreciated value of the existing pumps (originally costing Rs. 30,000) is set off. The major financial outlay till 1981 would, thus, be on the further development of the distribution system, including the construction of two more water towers in the university and northern sectors, involving a phased expenditure of about Rs. 8,00,000. Tube-wells have, however, a life of about 15—20 years generally and the possibility of required replacements after 1971 introduces a further cost of about Rs. 30,000. It is to be hoped that suitable sites, outside the Temple and the southern sectors, would be found for these two replacements, as also an additional tube-well and pump of about 30,000 gallons per hour capacity, that would be required towards the last phases of the town development after 1981.

9.9. A regrettable feature of the present water-supply system is the location of the R. C. C. water tower on the archaeological mound area of the Temple sector; the additional head of about 20 feet naturally gained thereby could well have been attained by increasing the height of the tower (which should have been desirably located in the northern sector) itself suitably. Obviously, its removal from the present site can only be assigned a lower priority in the context of more pressing requirements but the sites of the two proposed water towers have been indicated to avoid such errors. The final picture would be of three integrated distribution zones: the university sector, the northern sector and the remaining sectors. The additional distribution mains would naturally follow street alignments and, briefly stated, no significant obstacles exist to hinder normal engineering processes in their development as required.

Sewerage

9.10. Bodh Gaya received its present sewerage system also on the occasion of the Maha Parinirvana celebrations in 1956. The overall expenditure on it,

charged again to the 'Rural Water-Supply and Sanitation Programme' of the Government of India was Rs. 3,90,000 but, if a subsidy for W. C. traps and humepipes fitted to sanitary latrines of about a hundred individual dwellings—charged to the water-supply estimate—is transferred to it, the figure rises to Rs. 4,01,000 or, in other words, Rs. 50 per head of the design-population of 8,000 persons. The direct expenditure on the sewerage system may, however, be put at Rs. 3,16,000 (sewer lines : Rs. 44,000; sumps : Rs. 43,000; pumping sets : Rs. 34,000; rising mains from sumps to disposal plant, water-supply at sewerage outfall, and culverts and approach road thereto : Rs. 29,000; sewage disposal plant : Rs. 1,66,000).

9.11. The existing sewerage system of the town has, thus, in terms of the direct financial outlay, a lopsided character. The investment on the collection system, comprised of the sewer lines, amounts to only Rs. 5.50 per head of the design-population, the corresponding figure for the remaining components being Rs. 34. The collection grid is, therefore, seen to have presently the most rudimentary development and has a total length of about one and half miles. Further, from a study of the locations of the other components, serious deficiencies emerge requiring future remedial action.

9.12. The sewage disposal plant, located close to the north-western corner of the archaeological mound of the Temple sector, has a treatment capacity of about 2,40,000 gallons per day. Sewerage mains, running along the access artery and the riverside road up to the fringes of the present town development, join with three sumps—one at the edge of the access artery opposite the Thai monastery; and the other two at the south-western and north-eastern corners respectively of the mound. Pumps at these sumps force the sewage along rising mains, traversing the western and the northern edges of the mound, to the treatment plant. Seven sets of public latrines and baths, constructed during the celebrations, and some institutional (including government) and other buildings are presently connected to the above mains, which are yet to be extended to the bulk of the residential areas of the town. Though the estimate of the P. H. E. Department mentions that "Because of the place having historical and religious and archaeological importance, sewage disposal plant and sewer lines had to be located at particular sites and along particular alignments, the evidence is obviously altogether contrary. We must remember, however, that, due to the availability of a limited time, the scheme was in the nature of a rush job, with a consequently limited horizon.

9.13. In discussing the geographical background of the town, we have already noted that the overall slope of land is from south to north, fixing accordingly the alignment of the outfall sewer and location of the sewage disposal works. Naturally, the rational location of the latter would be at a suitable place to the north of the town. An examination of the topography between Bodh Gaya and the town of Gaya has, further, indicated the advantageous position, in this respect, of the Kendua-Gopibigha belt of hamlets, where the land slopes down from both sides to give the lowest contours—about 350 feet above mean sea-level. Since a disposal plant located here would also serve the future extension of rural sanitation to all hamlets in the area, as also the southern riverside parts of the town of Gaya, the site is naturally to be strongly recommended. A natural gradient of about 1 :570 for the main outfall sewer of Bodh Gaya (the alignment of which would, more or less,

follow the existing drainage channel) would thereby be obtained from the first sump (opposite the Thai monastery) to the proposed treatment works.

9.14. A mention has also been made in the same chapter of the local modifications of the topography due to two prongs jutting out from the ridge-land behind; one runs along the river from Mocharin and tapers off into the almost flat land (excluding the artificial elevation of the Temple area and the depression of an old moat all round) of the riverside at Bodh Gaya, while atop the longer and the higher one the Gaya-Dobhi Road runs. The latter introduces a natural cross-fall eastward of about 1 :330 up to the first sump along the access artery and, together with the outfall sewer, a sewerage main running parallel to the above would constitute the backbone of the town's collection-grid which would generally follow the street alignments. The detailed development would entail three additional sumps with pumping stations (in the university, south-western and northern sectors) for pumping local sewage along rising mains into the principal sewers outlined above, as excluding the university sector, the outlying hamlets in the green belt and the artificial configuration of the Temple sector, the town is, more or less, flat with a reduced level between 395 plus 2 feet above mean sea-level.

9.15. Coming to the question of costs, we may begin by noting that the town should have a treatment works of a capacity of about 4,20,000 gallons in 1981 and 6,00,000 gallons ultimately per day. If, as proposed, sanitation of other villages between Bodh Gaya and Gaya, as also a part of the latter itself, is integrated with it, the above capacity may require to be approximately trebled. Due to the proportionally lower costs of the higher capacity works, the costs chargeable to Bodh Gaya would even reduce thereby. All the same, however desirable it may be, there should be a natural hesitation in making the existing works, only seven years old and costing Rs. 1,66,000, a total loss of investment in the context of financial stringency. Purely in the context of physical development—which obviously is not the only overriding consideration here—its location is capable of satisfactorily serving all the sectors except the northern. The latter, though both in terms of existing and envisaged development it would contain the bulk of the town population, would, however, have a small development (as also the town generally) during the current Five-Year Plan period. We would, therefore, recommend that the existing plant should be allowed to outlive only its design capacity of about 8,000 persons (present town population 6,300) and steps should be taken during the Fourth and the Fifth Five-Year Plans to bring the new sewage disposal plant progressively into existence. Of its total cost of about Rs. 9,00,000 approximately a third would be chargeable to Bodh Gaya. Some readjustment of sewer gradients, in the northern sector only, would be required during the switch-over but, if the sector system is worked out in terms of the final picture, only one main sewer leading to the existing works, would require alteration. It should also be noted that the effluent, as also the dried sludge from the new works, can serve the irrigational needs of government and private farms, etc., and thus become a source of income. The overall development cost till 1981 of the sewerage system within the town itself, excluding the cost of the treatment works, may be of the order of about Rs. 8,00,000 including subsidies for individual latrines, for community latrines in residential area must be positively eliminated to maintain environmental hygiene; the ultimate costs may be about

Rs. 12,00,000 approximately when the town reaches its stage of the envisaged maximum population of about 20,000 persons thereafter.

Floods and Storm Drainage

9.16. The flood-aspect at Bodh Gaya relates to the Niranjana, of which a detailed consideration has already been made in the Chapter on 'Communications', in dealing with the proposed Bakraur-link and creation of a more or less, perennial water-front. The Niranjana, as we have seen, has a width of about 1,150 feet near Mocharin upstream of Bodh Gaya, after which—principally through a progressive erosion of the town banks over the ages—it has more or less stabilised itself in a width of about 2,000 feet and a shallow depth of 3—5 feet. Its cross-sectional area and gradient are sufficient to pass normal floods but the torrential nature of the stream occasionally leads it to overtop its banks for short durations. It has accordingly been suggested that, along with the detention of such floods through irrigation works some miles upstream of Bodh Gaya so as to moderate their intensity, a further protection needs to be provided through an embankment at the town itself. A further analysis has established that the best solution for the Bakraur-link and water-front would be river-training to reduce the width at Bodh Gaya, at least to that obtaining upstream, and a barrage carrying a road decking. Of the total cost of about Rs. 10,00,000 to Rs. 12,00,000 of the scheme, about 25 per cent may be required for flood protection and river-training works on both banks including earthwork and stone-pitching, etc.

9.17. The storm drainage problem at Bodh Gaya also includes a satisfactory drainage of the catchment area south of the town as the blocked drainage, through an overspill of the floods, has been known to dangerously raise the water-level in the lower parts of the town, particularly those south of the Temple. It is, therefore, necessary to adequately section and pitch the main drainage channel running south to north along the western periphery of the Temple precincts. The normal storm drainage system of the town would naturally run parallel to the streets but, instead of merely leading the water out of the town, it is recommended that only the surplus, after filling the town's existing and proposed tanks (irrigational, pisciculture and others) should be discharged out suitably along the main drainage channels into the river. The irrigational tanks are already linked, more or less, with a network of 'pynes' (viz., elementary rural watercourses) which can be improved through excavation of tanks and watercourses, sectioning, pitching, plantations, etc. and connected with a desirably underground storm drainage system for the development areas of the town. A functional and economic storm-drainage system for Bodh Gaya would, thus, comprise of both surface and underground drains independent of its sewerage system; its combination with the latter would greatly increase, in the context of a recorded precipitation of about 12" in 24 hours, the size of the sewers and of the sewage disposal works and make it difficult to obtain a self-cleansing velocity during the much reduced dry weather flow of sewage. Further, while the irrigational network (which would become a part of the storm drainage system) may be designed for an average precipitation of ¼" per hour, the increased impermeable area as well as the lesser time of concentration in the development areas would make it necessary to design their underground system in terms of a peak precipitation of about double the average. The overall costs may be about Rs. 10,00,000 of which at least half may be allocated to rural heads, such as minor irrigation, prevention of water-logging, etc.

SUMMARY, COST AND IMPLEMENTATION

10.1. The preceding chapters provide a comprehensive view of the factors governing a development plan for Bodh Gaya, as also of the proposals based on them. Though a summary has, by its very nature, inadequacies and limitations, it would nevertheless be fruitful in assisting a quicker grasp of the plan.

Imperatives Governing the Plan

10.2. The imperatives, which govern the planning of Bodh Gaya, are—

(*a*) The supremely important historical, cultural and archaeological background.

(*b*) The necessity of channellising physical and economic development in a manner that highlights the dominance of nature and spirit and does not either compromise or obscure the basic character of the town.

The plan-frame, based on the above imperatives, is outlined below :—

(*a*) The preservation of the Maha Bodhi Temple vista from the approach roads.

(*b*) The enhancement of serenity and aesthetic beauty within the Temple sector and generally within the whole town.

(*c*) Convenience of access to sites hallowed by the Lord during his meditations in Uru Vilva Vana (an enchanting forest land then covering the present town and environs).

(*d*) Needs of tourist homes, camping grounds, monasteries and rest-houses, meditation, recreational and symbolic parks, etc.

(*e*) Preservation of archaeological areas for excavation.

(*f*) Needs of the resident local population.

(*g*) Local-regional needs due to the town's function as a service-centre and the seat of rural (block) administration.

(*h*) The needs of the Magadha University and its co-relation with other requirements.

(*i*) The crucial importance of maintaining a rural economic base and, therefore, of conservation of land, intensive cultivation and rural industrialisation.

(*j*) The crucial importance of its retention as a small town for, as Sir Patrick Abercrombie—a noted town planner—puts it, "then its amenities and attributes are more readily grasped and assimilated".

(*k*) Assimilation of the overall town development within the proposed development of the Gaya-Manpur-Bodh Gaya complex.

Summary of Proposals

10.3. The Master Plan, worked round the above objectives, envisages a maximum population of about 20,000 persons, as against the census figure of 6,300 in the year 1961. Though the Plan does not deliberately attempt to force the decennial rate of growth (currently about 12%), it takes into account the sudden spurt that would be occasioned by the location of the Magadha University at Bodh Gaya. The estimates of 1981 population has accordingly been put at 14,000, including about 5,000 in the university sector.

10.4. Both in terms of the existing as well as proposed development, the town can be conveniently divided into seven sectors, viz., the southern, Temple, northern, north-western, south-western, western and the river-front sectors. In view of the traditional and archaeological importance of Bakraur on the opposite bank of the Niranjana, the Master Plan has further included its relevant parts as a separate sector.

(*i*) *Southern sector* (*total population* 462).—It contains the hamlets of Tikabigha and Urel (ancient Uru Vilva Vana) and an extensive mango orchard. The latter is proposed to be integrated in a meditation park which would be axially linked to the Maha Bodhi Temple by a pedestrian avenue. The relocation of the hamlets, falling outside the meditation park, is to be reviewed later.

(*ii*) *Temple sector* (*total non-institutional population* 1,791).—It exhibits presently multifarious land uses due to the unrealistic exploitation of the archaeological mound both by the public and private agencies, adversely affecting thereby the serenity and aesthetic beauty of the sector. The Master Plan seeks to remove them to the maximum extent so as to provide for archaeological excavation and for the development of a landscape park, around the Maha Bodhi, stretching up to the river. It is accordingly proposed to retain only the shrines, and the newly-constructed museum, central government rest-house and the water tower in this sector; eventually, the relocation of even these recent accretions is envisaged.

Circulation within the Temple sector would be established only along pedestrian avenues and a Temple by-pass, parking lots, etc., would cater to the needs of vehicular traffic.

(*iii*) *Northern sector* (*total population* 1,971).—It contains the hamlets of Dehariabigha, Upadhyaybigha, Rajapur, Sonubigha and Pachhati and—apart from the Temple sector—contiguous residential development is a feature presently only of this sector. The resettlement of population displaced from the Temple, north-western and south-western sectors in this sector would add another 2,200 persons to it. The Master Plan proposes its development as the main residential sector of the town with an ultimate capacity of about 10,000 persons.

Diagnostic surveys undertaken in connection with the Master Plan revealed an abnormally low female literacy of only 8%' and a social preference for separate educational facilities from the age 9+ onwards. These aspects, together with the desirability of small neighbourhoods in a rural setting, have led to the evolution of an interesting neighbourhood principle for the northern sector. Each neighbourhood would have a population of about 2,000—2,500, which would provide about 150—200 students of approximately the age-group 6+ to 8+ for a co-educational junior (lower primary) school serving as its focus; cultural facilities for the whole neighbourhood would be gathered at the latter. The neighbourhood would be subdivided in about four housing areas, each having a nursery-infant school for the age-group 3+ to 5+ as its focus. The latter would function, in addition, as the seat of adult female cultural, educational and recreational facilities.

Cultural and recreational facilities for the town as a whole would be catered for by the major recreational sub-sector (of the northern sector) which exploits the natural features, such as a large tank and is, further, conveniently located to serve tourist needs. Apart from playing-fields, community centre, rowing and angling facilities, etc., this sub-sector would also

contain an open air theatre. Other proposals for the northern sector include a new shopping-*cum*-business precinct, rural industrial estate, camping ground and cheap tourist homes, higher category schools, etc.

(*iv*) *North-western sector* (*total population* 775).—It covers the Miabigha hamlet, the high school in the ribbon of roadside land, the State seed multiplication farms, and the remote hamlets of Janpur, Bhagwanpur, Baijubigha and Bhum toli. The Master Plan proposes to leave the latter in the green belt, and to develop a symbolic deer park in the area released by the rest of the existing development in this sector. The park would thus fall on the approach artery from the Gaya-Dobhi Road and almost opposite the Thai monastery and tourist dormitory. Considerations of Temple vista prohibit any buildings in this sector.

(*v*) *South-western sector* (*total population* 514).—It presently contains the small hamlets of Pipalpati and Mastipur, the Thai Monastery-*cum*-rest-house, tourist dormitory, block development office and staff quarters, resettlement colony, a small library and youth hostel. The trans-regional high tension electricity line runs through this sector from south to north and, inevitably, affects its planning. In the light of existing development herein, as well as its ideal relationship to the Temple precinct, meditation and deer parks, this sector would contain all future monasteries-*cum*-rest-houses, superior residential area, 'quiet' offices and related employees' quarters, as also a new inspection bungalow, hospital and other institutions such as International Research Centre and Language Institute, Buddhist Art Gallery, etc.

(*vi*) *Western sector*.—The western sector, which is presently insignificant, has already been selected as the site of the Magadha University due to the donation of land by the Mahant of Bodh Gaya. The bulk of the land lies along the Gaya-Dobhi (G. T. link) Road and to the east of it. To maintain the Temple vista, as also a number of practical considerations, the Master Plan proposes the utilisation of this land, only for the purpose of staff residential area, university farm and playing-fields. The rest of the university development has been proposed on the opposite side of the Gaya-Dobhi Road with the Senate complex placed along the projected axis of the Maha Bodhi Temple (about two miles away) for imparting the whole development a symbolic association.

(*vii*) *River-front sector*.—Reclamation and landscaping, flood protection measures, creation of a water-front through the construction of a barrage-*cum*-roadway have been proposed in this sector. The roadway would link the traditional (e.g., Dharmaranya), archaeological (e.g., Stupa remains) and aesthetic areas in Bakraur on the opposite bank. A further development of communications would also help the tourists to visit the Prag-Bodhi hill beyond Bakraur.

(*viii*) *Bakraur sector*.—Landscaping of Dharmaranya (presently a sandy stretch of land along the Mohane), and the traditional sites of the Ajyapal tree, Sujata's hut, Matanga-Vapi temple and tank, etc., as well as the development of communications have been proposed in this sector. As already stated, however, lying as it does on the opposite bank of the Niranjana, it does not form part of Bodh Gaya proper.

10.5. Bodh Gaya, including contiguous development in adjoining villages, has an area of about 2,800 acres. The Master Plan proposals, outlined above, cover about 1,200 acres of it and leave the rest to crop cultivation; other agricultural uses, such as land for orchards,

nurseries, bee-keeping, pisciculture, etc., are largely catered for in the plan area itself. It is thus seen that the overwhelming bulk of land at Bodh Gaya has been conserved for agricultural uses for sustaining its rural economy.

10.6. Of the above 1,200 acres, the university sector covers about 320 acres, the development costs of which need not be considered together with the rest of the proposed development, except for its share of costs of public utilities and services, etc. Even in the remaining area of about 880 acres, intensive development would be a feature of ultimately 500 acres only and the balance would be composed of meditation and deer parks, the Temple sector, the major recreational sub-sector and river-front development.

Cost of the Development Plan

10.7. From the above picture, it is possible to frame approximate estimates of the cost of realisation of the development plan for Bodh Gaya (excluding the university sector). It would be wise, however, to do so for a defined perspective of time and the costs are accordingly being assessed for the proposed development till the year 1981 for an envisaged non-university population of about 9,000. The following table itemises the major costs of proposals envisaged in this time perspective :—

	Rs.
Acquisition and development of about 330 acres for meditation park, deer park, Temple landscape park, major recreational sub-sector, river-front and archaeological excavation schemes at the rate of Rs. 6,000 per acre.	19,80,000
Compensation for acquired structures in clearance areas.	15,00,000
Acquisition and development of about 250 acres for residential and allied needs at the rate of Rs. 15,000 per acre.	30,00,000
Construction of rural industrial estate ...	2,00,000
Construction of business-*cum*-shopping precinct, transport terminals, parking lots, etc.	8,00,000
Construction of schools and neighbourhood centres.	10,00,000
Construction of hospital and health centres	7,50,000
Construction of International Research Centre, Language Institute, Buddhist Art Gallery, etc.	10,00,000
Construction of community centre, open air theatre, etc.	5,00,000
Construction of tourist homes, camping ground, rest-houses, etc.	12,50,000
Construction of barrage-*cum*-roadway, flood protection, development of communications and of important sites in the vicinity.	25,00,000
Re-housing and new housing generally on aided self-help basis.	12,50,000
Agricultural support programmes ...	12,70,000
TOTAL	1,70,00,000

Ways and Means of Financing

10.8. It is obvious that an investment of Rs. 1.70 crores, in the coming 17 years, is well beyond the capacity of the Government of the State of Bihar. Its average contribution can be expected around Rs. 2,00,000 annually and the question of finding the bulk of the funds, inevitably brings the Government of India and the foreign governments, vitally interested in the development of Bodh Gaya, into the picture. Basically, an average annual contribution of Rs. 8,00,000 from these governments has a modest enough dimension, and suitable financial arrangements could certainly be worked out between them.

10.9. It is important to point out here that almost the entire investment at Bodh Gaya would assume the nature of a subsidy, unless a part of it recovered through the sale of developed plots only to institutions and individuals, who can afford payment. Non-commercial plots should, thus, fetch about Rs. 30,000 per acre and commercial plots about twice this figure.

Phasing and Implementation

10.10. The total development programme has obviously to be phased and co-related to National Five-Year Plan periods. The first phase would, thus, cover the remaining period of the Fourth Five-Year Plan, viz., a little more than two years, during which firm foundation must be laid for accelerated development in the succeeding Five-Year Plans till 1981. Creation of suitable town management and development agencies; land acquisition and partial land development are, accordingly, proposed as the first phase programme.

10.11. Within the ambit of existing legislation a Town Planning Authority has been established for the area covered by the Master Plan and its surrounding green belt. A Notified Area Committee should also be established, the creation of which would not only enable the Local Self-Government Department to allocate funds for town management, etc., but the housing department also to do so for town development schemes, e.g., slum clearance, housing and land development. The task of the T. P. A. would be to control and foster town development in accordance with the Master Plan, through the application of the Bihar Restriction of Uses of Land Act and the Bihar Town Planning and Improvement Trust Act. The establishment costs of the N. A. C. and the T. P. A. would, for the present, total about Rs. 1,00,000 a year, in other words, about Rs. 2,00,000 for the first phase period of two years.

10.12. Coming to land acquisition costs, about 200 acres, out of the total area of 580 acres proposed to be developed till 1981, are either already acquired or under irremovable land uses, such lands lie in the Temple, north-western and south-western sectors. Since land acquisition costs would continue to rise and the land itself may become undesirably developed, it is proposed that the remaining 380 acres, excluding built-up areas, should be immediately acquired. The costs involved in acquisition of vacant land may accordingly be put at Rs. 7,60,000 approximately.

10.13. Land development, during the first phase, would not cover much of the Temple sector which has a large number of dwellings, shops, etc.; it would become possible during the second phase, the Fifth Five-Year Plan with the acquisition of the clearance area. Similarly, unless the undesirably located high school (of small dimension and private ownership) and the State seed multiplication farm can be urgently relocated, the deer park would also have to be deferred till that period. The development of the meditation park and the major

recreational sub-sector, however, presents no such difficulty. All the same, to keep the first phase investment down, their partial development at a total outlay of Rs. 1,80,000 is proposed.

10.14. Apart from the above, some land would also require to be developed intensively with roads, water-supply, drainage, etc., to meet the needs of relocated institutions, displaced individuals, monasteries, rest-houses, intending settlers, business, commerce, transport, etc. Partial development of about 150 acres, at an outlay of about Rs. 4,60,000, is proposed on this account, and the balance of development would be continued in other phases.

10.15. The first phase expenditure, accordingly, works out to Rs. 16,00,000 and forms an irreducible minimum for generating an adequate momentum for the completion of the total programme. The establishment costs of the N. A. C. and the T. P. A., amounting approximately to Rs. 1,00,000 annually, may be borne by the Local Self-Government Department. Further, the Housing, P. W. D., Tourism Departments of the State Government may provide about Rs. 2,50,000 annually. For the two years involved, a total of Rs. 7,00,000 may thus be expected from the State Government. The remainder of Rs. 9,00,000 has to be contributed by the Government of India, foreign governments and institutions interested in the development of Bodh Gaya.

10.16. Provided investment of the order indicated above is made during the Fourth Five-Year Plan period, a balance of Rs. 1.54 crores would be required during the two succeeding phases, viz., the Fifth and Sixth Five-Year Plans till 1981. The second phase (i.e., Fifth Five-Year Plan) budget is proposed at approximately Rs. 40,00,000 so as to cover (*i*) the acquisition of clearance areas mostly lying in and around the Temple sector, (*ii*) re-housing generally on the basis of aided self-help, (*iii*) continuance of land development initiated in the first phase, (*iv*) construction of an open air theatre, rural industrial estate, Buddhist Art Gallery and some schools, camping ground and part of the business-*cum*-shopping precinct. Similarly, in the context of the total programme, the third and the fourth phases may be roughly envisaged at Rs. 60,00,000 and Rs. 54,00,000 respectively.

BODHGAYA
MASTER PLAN

- MAHABODHI TEMPLE
- MONASTERIES
- PUBLIC & SEMI PUBLIC USES
- RESIDENTIAL AREAS
- COMMERCIAL
- TRANSPORT STAND
- GOVT. REST HOUSE & HOSTELS
- ARTERIAL & OTHER ROADS
- UNIVERSITY LAND
- VACANT GOVT. LAND
- WATER SHEETS & COURSES
- PUBLIC OPEN SPACES
- GOVT. FARM LAND
- AGRICULTURAL LAND
- ORCHARDS
- OFFICES
- SCHOOLS
- HOSPITAL
- MUSEUM
- LIBRARY
- PUMP HOUSE
- BURIAL GROUND
- TEMPLE
- SEWAGE DISPOSAL PLANT

TOWN PLANNING SECTION (L.S.G.) BIHAR

EXISTING LAND USE

DEALT BY:- K.L. DEO

SCALE:- 1320 FT. 1 INCH.

J.C.P. SINHA.	L.G. CHAUDHARI	R.L. BAWA
ASST. TOWN PLANNER GOVT. OF BIHAR	STATE TOWN PLANNER GOVT. OF BIHAR	CHIEF TOWN PLANNER GOVT. OF BIHAR

BODHGAYA
MASTER PLAN

- MAHABODHI TEMPLE
- MONASTERIES
- MEDITATION PARK
- LAND TO BE RECLAIMED
- RESIDENTIAL AREAS
- COMMERCIAL AREAS
- RURAL INDUSTRIAL AREAS
- CAR PARK & TRANSPORT STAND
- GOVT. REST HOUSES & HOSTELS
- EDUCATIONAL AREAS
- ARTERIAL & OTHER ROADS
- PATH-WAYS
- DEER PARK
- UNIVERSITY AREAS
- ARCHAEOLOGICAL AREA
- WATER SHEETS & COURSES
- PUBLIC OPEN SPACES
- MAJOR RECREATIONAL AREAS
- GREEN BELT
- OFFICES
- SCHOOL
- HOSPITAL
- MUSEUM
- LIBRARY
- TEMPLE
- BUDDHIST CULTURAL CENTRE
- CAMPING GROUND

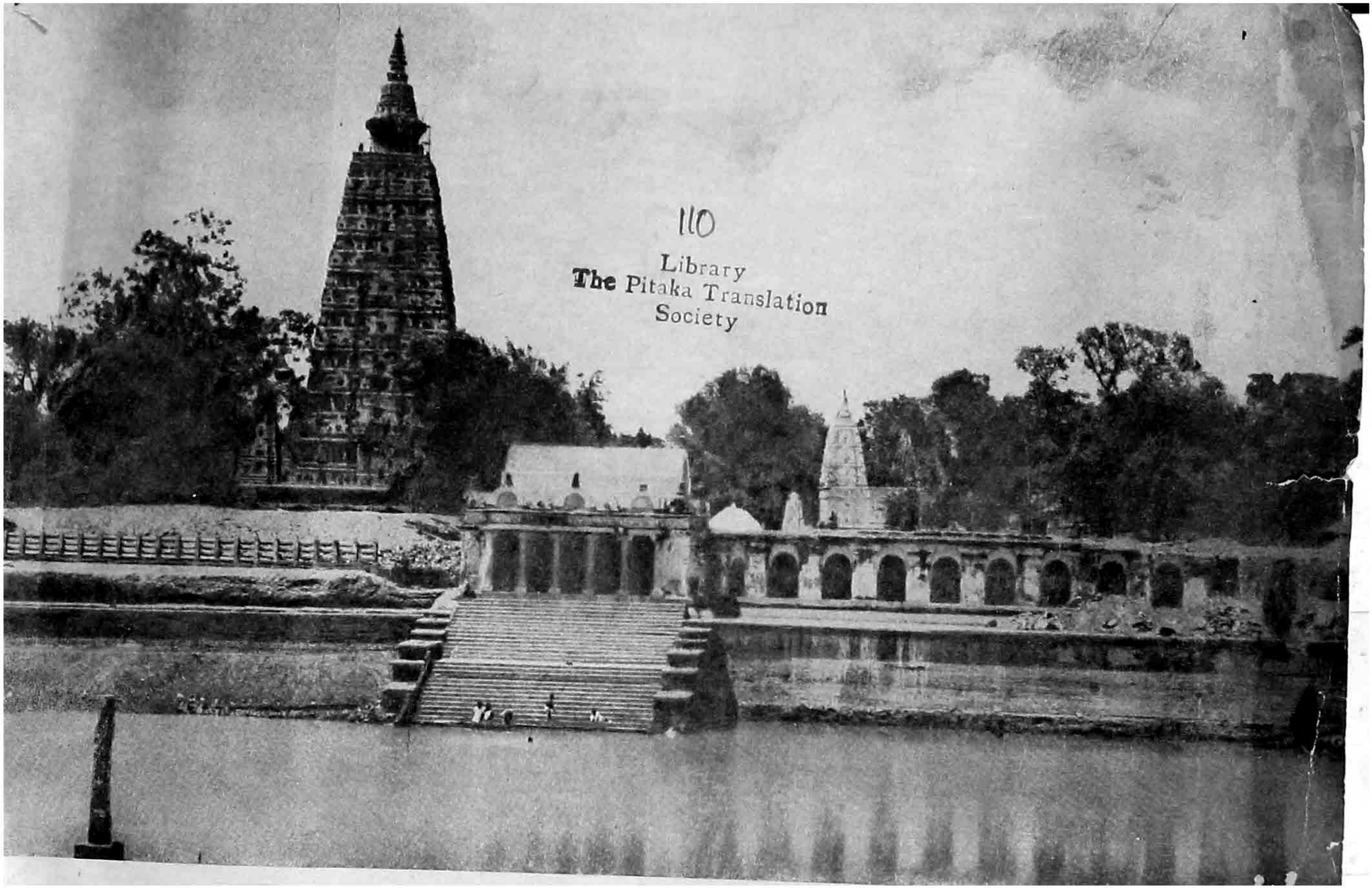
TOWN PLANNING SECTION LSG BIHAR

PROPOSED LAND USE

DEALT BY -
K.L. DEO

SCALE - 1320 FT. TO 1 INCH

J.C.P. SINHA	L.G. CHAUDHARI	R.L. BAWA
ASST. TOWN PLANNER GOVT. OF BIHAR	STATE TOWN PLANNER GOVT. OF BIHAR	CHIEF TOWN PLANNER GOVT. OF BIHAR



View of the Bodh Gaya Temple from the River Niranjan

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