

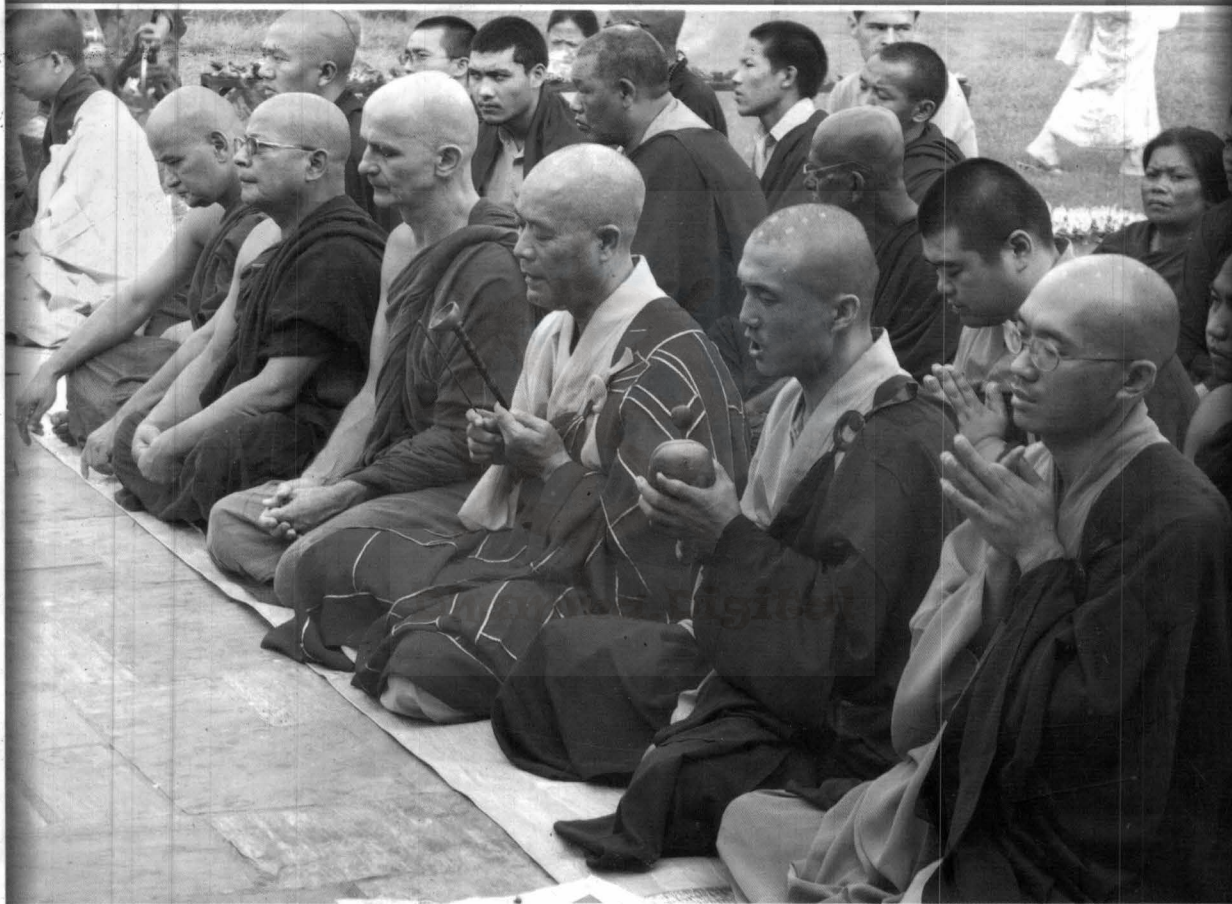
LUMBINI

BUDDHA JAYANTI

Year 13

No.17

May. 2007



Different monks from different monasteries of Lumbini attend the full moon prayer in the Asoka Pillar, Lumbini Sacred Garden



INTERNATIONAL BUDDHIST SOCIETY
BUDDHA NAGAR, LUMBINI



In memory of Late Dharma Ratna Shakya,

**Who passed away on 9th January, 2007 in Lumbini
while he was doing the survey on**

the arriving of the Muslim community in surrounding area of Lumbini and Kapilavastu

Advisor: International Buddhist Society, Buddha Nagar, Lumbini

Advisor: International Buddhist Meditation Centre, Sankhamole, Kathmandu,

Founder: Nepal Bauddha Pariyatti Siksha (Nepal Buddhist Scriptural Society),

Famous writer, Social worker, Poet and also who had taken care of Ven. Bhikkhu Maitri,

Our Chairman from the child hood till he went to the heaven.



May he attain Nibbana.

**International Buddhist Society,
Buddhanagar, Lumbini**

LUMBINI

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International Buddhist Society
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Year 13 No.17 Buddha Jayanti May 2007

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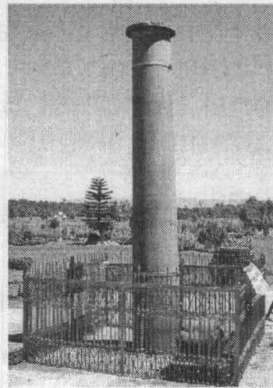
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**Oh Ananda,
the place where faithful persons
should know, see and have sense of urgency
is Lumbini Sacred Garden where I,
Tathagata was born."**

(Mahaparibbana Sutta, Digha Nikaya, Mahavagga, Tripitaka
Vol. 10, page 104, clause 130)

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Happy New Year 2064

&

Wish you all the best on the
occasion of the Buddha Jayanti

*Remember us:
for exquisite and finely crafted
Statues and thangkas*

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धमनिहवा स्थित ठूलो स्तूपको वास्तु संरक्षण

STRUCTURAL CONSERVATION OF SMALL STUPA: DHAMNIHAWA

(15 June 2003 – July 2003)

बसन्त बिडारी

मुख्य पुरातत्व अधिकृत

लुम्बिनी पबित्र उद्यान

२०५६/२/१६ देखि ३१ सम्म

१. अवस्थित -

कपिलवस्तु जिल्लाको सदरमुकाम तौलीहवादेखि करिब ३.५ कि. मि. उत्तर तिलौराकोट गा.वि.स वडा नं. १ मा अवस्थित दुई वटा प्राचीन स्तूप, जसलाई धमनिहवा जोडी स्तूपको नामबाट चिनिन्छ। यो स्थल लुम्बिनीदेखि २९ कि.मि पश्चिम-उत्तर, पूर्व- पश्चिम महेन्द्र राजमार्गदेखि करिब २० कि.मी. दक्षिणमा र प्राचीन कपिलवस्तु राज्यको राजधानी तिलौराकोटदेखि लगभग ७०० मि. उत्तर र बाणगंगा नदी -प्राचीन भगिरथी नदीको पूर्वी किनारादेखि लगभग ३०० मि.को दूरीमा अवस्थित छ। यस स्थानमा पुग्न हालसम्म पनि बाटोको सुविधा छैन।

२. स्थानको नामाकरण :

यो स्तूप धमनिहवा गाउँमा अवस्थित भएको हुँदा यसको नाम धमनिहवा स्तूप रहन गएको हुन सक्छ। “धमनि” शब्द पाली भाषाको “धम्म” शब्दबाट अपभ्रंस भई बनेको हुनुपर्छ। “धम्म” को नेपाली को संस्कृत भाषामा “धर्म” हुन्छ। स्तूपहरुको प्रकार मध्ये “धम्म स्तूप ” एक प्रकारको स्तूप हो। यस्तो स्तूप निर्माण गर्दा बौद्ध धर्मसंग सम्बन्धित कुनै पनि धार्मिक ग्रन्थ वा सुत्र जुन कागज, माटोको, काठको वा शिलापत्रमा लेखी गर्भ गृहमा राखी निर्माण गरिएको हुन्छ। सोही अनुरूप यस स्थानमा स्तूप निर्माण भएको हुनसक्छ। पछि यस स्थलमा वस्ती विकास हुन गई कालान्तरमा “धम्म” बाट “धमनि” हुन गएको र “धमनी” मा “हवा” प्रत्यय (“हवा”) शब्दले स्थानिय अवधी भाषामा सानो वस्ती विशेषलाई जनाउँदछ। जोडिन गई उक्त स्थानको नाम धमनिहवा भएको हुनुपर्छ। (धम्म> धर्म, धम्म> धमनि+हवा = धमनिहवा)

३ महत्व

कुनै पनि पुरातात्विक अवशेष राष्ट्रको अमूल्य निधी हो। यस्ता अवशेष वा सांस्कृतिक धरोहरको राष्ट्रको चिन्तारीमा महत्वपूर्ण स्थान रहन्छ। त्यस्तै अमूल्य सांस्कृतिक धरोहर धमनिहवा जोडी स्तूप पनि हो। यसका अतिरिक्त स्तूप शब्द बौद्ध धर्मसंग सम्बन्धित हुनुको साथै भगवान् गौतम बुद्ध र बौद्ध धर्मसंग प्रत्यक्ष सम्बन्ध भएको प्राचीन कपिलवस्तु राज्यको राजधानी हालको तिलौराकोटको समीपमा रहेकाले यी धमनिहवा जोडी स्तूपको धार्मिक, ऐतिहासिक तथा पुरातात्विक महत्व रहेको छ। त्यसैले यस क्षेत्रको (स्तूपको) संरक्षण, विकास तथा प्रचार प्रसार हुन अति जरुरी देखिन्छ।

४. तीर्थ यात्रीहरुको बर्णन :

भगवान् गौतम बुद्ध तथा बौद्ध धर्मसंग प्रत्यक्ष सरोकार रहेको कपिलवस्तु तथा लुम्बिनी क्षेत्रको विभिन्न स्वदेशी तथा विदेशी यात्रीहरुले शताब्दीयौ अगाडिदेखि भ्रमण गरी यस क्षेत्रको बारेमा धेरै कुराहरु उल्लेख गरेको पाइन्छ। त्यसमा पनि इस्वी पाचौं र सातौं शताब्दिमा यस क्षेत्रको भ्रमण गर्ने चिनिया यात्री क्रमशः फा-स्यान Fa-Shien र युवान - च्वाङ Yuan chwang को बर्णन उल्लेखनीय रहेको छ। यी यात्रीहरुले लुम्बिनी, रामग्राम, कपिलवस्तुको भ्रमण गरेको कुरा आफ्नो यात्रा विवरणमा उल्लेख गरेका छन्। कपिलवस्तुमा



प्राचीन शाक्य राजधानी (तिलौराकोट), निग्रोधाराम (कुदान), ऋकुछन्द बुद्धको जन्म तथा निर्वाणस्थल (गोटिहवा), कनकमुनी बुद्धको निर्वाण स्थल (निग्लिहवा), शाक्यहरुको सामूहिक बधस्थल (सग्रहवा) लगायत अन्य स्थलहरुमा पुगेको र त्यहाँ देखेको कुरा आफ्नो यात्रा विवरणमा लेखेका छन्। जुन विवरण आज त्यस क्षेत्रको बारेमा जान्न अध्ययन अनुसन्धान गर्न प्रमुख स्रोत बन्न गएको छ।

फा. स्यान Fa-shien, 409 AD (४०९ इस्वी) का अनुसार - " There are towers erected on the following spots – at the place where he (Rishi) Asita calculated the horoscope of the Royal Prince.....at the place where virudaka Raja killed the offspring of the Sakya (Beal 86-87: 1993).

युवान - च्याङ Yuan chwang, 636AD (६३६ इस्वी) ले आफ्नो यात्रा वर्णनमा विस्तृत रूपमा वर्णन गर्दै " To the north-east of the capital where several hundred thousand topes where the Sakyas were put to death. When King Virudhaka conquered the Sakyas and took them prisoners to the number of 99,000. He caused them all to be massacred. The corpses were strewn about in heaps and the blood made a pond, on prompting of devas the skeletons were collected and Buried. To the south west of these topes were four small topes where four Sakyas repulsed the army..... (Watters; 8: 1973).

फा - स्यान र युवान - च्याङले आफ्नो यात्रा वृतान्तमा शाक्यहरुको बध स्थल सग्रहवाको उल्लेख गर्दै राजधानी (हालको तिलौराकोट) देखि पूर्व उत्तरतर्फ हजारौं स्तुपहरु (Towers, Several hundred thousand Topes) भएको बताएका छन्। युवान - च्याङले बताए अनुसारका स्तुपहरु धमनिहवा र सग्रहवामा रहेका हुनसक्छन्। सन् १८९५ मा डा. फुहररले सग्रहवाको अन्वेषण गरी १७ वटा स्तुपको उत्खनन् तथा अध्ययन गरी प्रतिवेदन प्रकाशित गरेका छन्। हाल पनि धमनिहवा, निग्लिहवा, तिलौराकोट, सग्रहवा आदि पुरातात्विक क्षेत्रहरुका अतिरिक्त यी क्षेत्रहरुको आस पासका गाउँहरुमा प्राचीन इटा तथा माटाका भाडाहरु पर्याप्त मात्रामा पाइन्छन्। अतः तिलौराकोटदेखि उत्तरतिरको क्षेत्रमा व्यापक अध्ययन अन्वेषण गरेमा फा-स्यान र युवान - च्याङले उल्लेख गरेका सहस्रौं स्तुपहरु तथा पुरातात्विक स्थलहरु पाइने सम्भावना रहेको छ।

५. पूर्व पुरातात्विक अन्वेषण, उत्खनन् र संरक्षण :

(क) पूर्व अन्वेषण र उत्खनन् :

पुरातत्व विभागबाट प्रकाशित "प्राचीन नेपाल " वर्ष सन् १९७७ नं. ४१- ४२ मा श्री तारानन्द मिश्रद्वारा लिखित "The Location of Kapilvastu and Archaeological Excavations, 1967-72" लेखलाई सन् १९७८ मा लुम्बिनी विकास समितिले पुनः प्रकाशित गर्‍यो। उक्त लेखमा सर्वप्रथम धमनिहवा जोडी स्तुपको बारेमा उल्लेख पाईएको छ। लेखको मिति सन् १९६७-७२ भएको हुँदा स्तुपको अन्वेषण र उत्खनन् कुन मितिदेखि कहिलेसम्म भयो सो को उल्लेख खुलेको पाइदैन। श्री रिजालको Conservation रिपोर्टमा (1972-73)" Repairs were carried out to two Buddhist Stupas Excavated by Department in 1968 -69 " भनिएको हुँदा सम्भवतः उत्खनन् कार्य सन् १९६८ ६९ मा भएको हुनुपर्छ।

उत्खनन्कर्ता श्री तारानन्द मिश्र Tarananda Mishra का अनुसार "Twelve hundred feet north of Tilaurakot, at a place called Dhamnihawa, twin Stupas had been found and properly excavated . Cross sections A-B and C-D had been taken across the stupas, leaving balks of 1 1/2 broad for the study of the sections."

The Small Stupa:

"The second stupa, located at the distance of nearly 15 feet north of the big stupa, was found

to be having 26 feet of diameter and made of only one phase. All the bricks of this stupa were of the wedge shaped, and nothing had been found in the central cutting of this stupa too. In this stupa eight brick courses in elevation had been encountered. It was possibly a votive stupa offered by some religious people and was possibly made between the third and fourth phase of the big stupa."

श्री मिश्रका अनुसार धमनिहवा ठूलो स्तुपको करिब १५ उत्तरमा २६ व्यास (diameter) भएको सानो स्तुप छ। उहाँका अनुसार यो स्तुप एकै काल (Phase) मा बनेको र निर्माण काल प्रथम शताब्दि ई.पू तिर देखिन्छ। तर यस भनाईलाई पुष्टि गर्ने कुनै पनि प्रमाण उत्खननमा प्राप्त नभएको कुरा प्रतिवेदनमा उल्लेख छ। यो स्तुप कुनै धार्मिक ब्यक्ति (Religious People) ले निर्माण गरेको Votive स्तुप हुन सक्ने उल्लेख गर्दै यस स्तुपको सबै ईटाहरु Wedge Shaped र स्तुपको उचाई आठ तह इटाद्वारा निर्माण भएको (8 brick courses in elevation) प्रतिवेदन उल्लेख छ।

(स्व) पूर्व संरक्षण :

श्री बाबुकृष्ण रिजालको "Excavation Exploration and other Archaeological activities in Tilaurakot : 1972-73 नामक लेख "प्राचीन नेपाल" संख्या २२, माघ, २०२९ मा प्रकाशित भएको छ। उक्त लेखमा धमनिहवा जोडी स्तुपको संरक्षण कार्य सम्बन्ध छोटो रिपोर्ट उल्लेख छ।

श्री रिजालका अनुसार (Rijal) Repairs were carried out to two Buddhist Stupas excavated by the Department in 1968-69. The two Stupas located at a place now called Dhamnihawa at a distance of about 500 yards north of Tilaurakot, may mark an important spot connected with the life of the Buddha and are traditionally believed to have been built to commemorate Siddhodana and Mayadevi, the parents of the master".

"Both the Stupas were affected by weather and rains as they remained exposed in the tropical climate of the Tarai. As a result the courses started disintegrating and most of the bricks became fragile."

सानो स्तुपको बारेमा :

"The smaller stupa, which has suffered a greater damage, has been for the present covered up with earth by constructing a five feet high circular retaining wall all around. It is proposed to be repaired next year"(Rijal, 69: 1973)

तराईको Tropical climate कारणले सानो स्तुप पूर्णतया Damage भएको कुरा उल्लेख गर्दै त्यसको अस्थायी संरक्षणको लागि चारैतिर ५" अग्लो Retaining wall लगाएको, आगामी साल संरक्षणको प्रस्ताव राखेको आदि कुरा रिजालको रिपोर्टमा पाइन्छ। तर उल्लेखित ५ फिट Retaining wall पूर्णतया Disappear र स्तुपको वास्तविक अवस्थाको तस्वीर र Drawing पनि लेखमा प्रकाशित छैन। अर्को वर्ष संरक्षण गरिने भनिएकोमा संरक्षण कार्यको कतै उल्लेख भएको पाइदैन। श्री रिजालद्वारा लिखित Archaeological Remains of Kapilvastu, Lumbini and Devadaha, 1979 नामक पुस्तकको अन्तिम चौथो पृष्ठमा धमनिहवा स्थित संरक्षित जोडी स्तुपको फोटो प्रकाशित छ। तर सानो स्तुपको फोटोले Number of brick courses, height आदि विस्तृत जानकारी दिन सकेको छैन। संरक्षण कार्यको कतै प्रतिवेदन उल्लेख पाइदैन। हाल संरक्षणको अभावमा स्तुपको भौतिक अवस्था आज भन्दा ३० वर्ष अघि प्रकाशित लेखमा उल्लेख भए भन्दा जीर्ण अवस्थामा रहेको छ। जुन कुरा धमनिहवा स्थित ठूलो स्तुपको वास्तु संरक्षण (२०५२।२।१६-२०५६।२।३१) कार्यको प्रतिवेदनमा पनि उल्लेख गरिएको थियो। (Bidari, Structural conservation of Big Stupa at Dhamnihawa, 1999)

**६. हालको संरक्षण :**

अति जीर्ण अवस्थामा रहेको र लामो समयदेखि संरक्षणको प्रतिक्षारत धमनिहवा स्थित सानो स्तुपको संरक्षण गर्न अति आवश्यक भएकोले लुम्बिनी विकास कोषले आ.व. २०५९/६० को वार्षिक कार्यक्रम अन्तरगत पुरातत्व महाशाखाबाट पुरातात्विक संरक्षणको मूल्य मान्यताको परिधीभित्र रहि बैज्ञानिक तवरबाट धमनिहवा स्थित सानो स्तुपको संरक्षण कार्य सम्पन्न गरेको छ ।

७. संरक्षण कार्य टोली :

धमनिहवास्थित सानो स्तुपको संरक्षण कार्यको लागि लुम्बिनी विकास कोष पुरातत्व महाशाखा प्रमुख श्री बसन्त विडारीको निर्देशनमा रही धमनिहवा स्थित सानो स्तुपको संरक्षण कार्य सम्पन्न गर्न कोषमा कार्यरत पुरातत्व अधिकृत श्री धुवनारायण पाण्डे र पु.अ. कृष्णबहादुर के.सी. लाई कार्यालयबाट संरक्षण कार्यको जिम्मा दिइएको थियो । साथै फोटोग्राफीका लागि कोषका फोटोग्राफर श्री अरविन्दमानसिंह शाक्य र प्राविधिक सहयोगको लागि कोषका ब.ई. श्री सन्तोष लामाले पनि समय- समयमा संरक्षण कार्यमा सहयोग गरेका थिए ।

८. कार्य प्रारम्भ :

टोलीले आफ्नो कार्यदिशमा उल्लेख भएअनुसार २०६०/३१ गते कार्यस्थल धमनिहवा पुगी सोही दिनदेखि कार्य प्रारम्भ गरेको थियो ।

९. संरक्षण कार्यमा अपनाइएका पुरातात्विक मूल्य मान्यताहरू :

- (क) Photographs Drawing को अभावमा श्री मिश्र र श्री रिजालको प्रतिवेदन र वर्तमान भौतिक अवस्थालाई आधार मानी संरक्षण गर्ने ।
- (ख) प्राचीनतम स्वरूप दिने ।
- (ग) हालको सतहबाट संरक्षण कार्य शुरु गर्ने ।
- (घ) पुरानो नाप साध (Measurement) को आधारमा कार्य गर्ने
- (ङ) इस्वी पूर्वका पुराना ईटा र ईटाका टुक्रा प्रयोग गर्ने
- (च) सुर्खी चुनाको मसला (Mortar) को प्रयोग गर्ने ।

१०. संरक्षण कार्यमा प्रयोग भएका सामग्रीहरू :

- (क) पुराना ईटा : इसा पूर्व कालका इटा तथा इटाका टुक्राहरू ।
- (ख) मसला (Mortar) : संरक्षण कार्यमा पुरानो ईटा जोड्नको लागि सुर्खी (Brick power) र कल्ली चुनाको मसला प्रयोग । (चुनालाई ७०-७२ घण्टासम्म भिजाई तार जालीले छानी चुना र सुर्खी १:२ को अनुपातमा मिलाई मसला तयार गरिएको छ) ।

११. स्मारक (सानो स्तुप) को भौतिक अवस्था, नाप र संरक्षण :**(क) संरक्षण अगाडि :****१. सफाई गर्नु आगाडिको अवस्था :**

टोलीले आफ्नो काम शुरु गर्नु अघि स्तुप वरपरको क्षेत्र तथा स्तुपमाथि भारपात, सानातिना बोटविरुवा र माटोले पुरिएको अवस्थामा थियो र स्तुपको आकार प्रकार केही देखिदैन थियो । केवल स्तुपको आकार मात्रा अनुमान गर्न सकिन्थ्यो । कुनै प्रकारको नाप, साध गर्न सकिने अवस्थामा थिएन ।

२. सरसफाई पछिको अवस्था :

टोलीले स्तुप वरिपरिको क्षेत्र र स्तुपको माथिको फारपात, माटो हटाउने कामबाट कार्य प्रारम्भ गरेको थियो । फारपात, वोटबिरुवा, माटो हटाइ कुचो, बसले सफा गरेपछि जीर्ण अवस्थामा स्तुपको आकार देखिन आयो । जीर्ण अवस्थाको स्तुपको विवरण निम्न अनुसारको थियो ।

- अ. स्तुपलाई चारैतिरबाट एक सतह नयाँ ईटाले घेरिएको पाइयो ।
- आ. नयाँ ईटालाई कतै कतै स्तुपको परिधि (Circumference wall) ले चापेको (overlapping) देखिएको ।
- इ. जमिनको सतहमा रहेको स्तुपको परिधिको ईटा पूर्ण परिधि २४.९० मि. मध्ये स्तुपको पश्चिम पट्टीको भागमा ५.१७ मि. र दक्षिण पूर्वी कुनाको भागमा २.७५ मि. मात्र ईटा भएको र बाँकी भाग माटो रहेको ।
- ई. जीर्ण अवस्थाको स्तुपलाई अवलोकन गर्दा Top finishing मा 7 rings भएको, ring को नाप बीचबाट क्रमशः बाहिर ९४ से.मी., ७१ से.मी., ४३ से.मी., ४१ से.मी. ४३ से.मी., ४६ से.मी., र ५८ से.मी. का थिए ।
- उ. सफाई पश्चात जीर्ण अवस्थाको स्तुपको उचाई नाप गर्दा धेरै भाग जमिनको सतहको अवस्थामा थियो । परिधिको देवालको केहि बाँकी भाग-पश्चिम र दक्षिण पूर्वी भागमा) ६.४ से.मी., उत्तर र दक्षिणपट्टीका केही भाग ० देखि १५ से.मी. र बीचको थोरै मात्र भाग ३२ से.मी. को उचाईमा थियो ।

स्व. स्तुपको संरक्षण, संरक्षणपछिको अवस्था र नाप :

- अ. संरक्षण : मिश्रको उत्खनन् प्रतिवेदन र श्री रिजालको संरक्षण प्रतिवेदनमा प्रष्ट फोटो, नक्सा (Drawing) नभएको हुँदा श्री मिश्रको उत्खनन् प्रतिवेदनमा "..... was found to be having 26 feet of diameter In this stupa 8 brick courses in elevation have been encountered" भनिएको हुँदा यसैलाई आधार मानी २६ मि. को व्यासमा किनारमा ८ तह ईटाको उचाईमा यस स्तुपको संरक्षण गरिएको छ ।
- आ. संरक्षणको क्रममा २६ फिट (७.९२ मि.) को व्यास लिनको लागि १३ फिट (३.९६ मि.) को अर्ध व्यासले स्तुपको केन्द्रबाट गोलाई खिच्दा कतै कतै स्तुपको बाहिरी परिधिको देवालले नयाँ ईटाबाट बनाइएको Outline लाई ढाकेको (Overlapping) हुँदा हाल उक्त ढाकेको भागलाई हटाई पुरानै अवस्थामा ल्याई संरक्षण गर्दा स्तुप पूर्ण गोलाईमा नभई अर्ध व्यास १३ फिटमा ३ से.मी. देखि १३ से.मि.सम्म फरक परेको छ । दक्षिण उत्तर कुनामा मात्र ३.९१ मि.देखि बढीमा ४.०९ मि. सम्मको अर्ध व्यास रहेको छ ।
- इ. स्तुपको जमिनको सतहमा रहेको परिधी देवालको बाँकी ईटालाई यथावत राखी अन्य भागमा भएको माटो हटाई पुराना ईटा र नयाँ मसलाबाट संरक्षण कार्य शुरु ।
- ई. स्तुपको व्यासको नाप लिएपछि व्यासभित्र जमिनको सतहदेखि नै पुराना ईटा र नयाँ मसलाबाट स्तुपलाई सात तह ईटासम्म पूर्णतया ठोस रूपबाट उठाइएको छ । अन्तिम आठौँ तह ईटामा Top finishing गर्दा पुरानै अवस्था र नाप अनुसारको बीचबाट क्रमशः बाहिरतिर ९४ से.मी., ७१ से.मि., ४३ से.मि., ४१ से.मि., ४३ से.मि., ४६ से.मि., र ५८ से.मि. नाप भएका ७ रिड बनाइएको छ ।



उ. अन्य स्तूपजस्तै यो स्तूप पनि बीचमा केही (७७ से.मि.) अग्लो र बीचदेखि बाहिरतिर क्रमशः भिरालो (Slope) मा रहेको छ। स्तूपको बाहिरी देवाल (Circumference wall) को उचाई जमिनको सतहदेखि उत्तर र पूर्वमा ५२ से.मि. छ भने दक्षिण र पश्चिममा क्रमशः ५३ से.मि. र ५० से.मि. छ। स्तूपको पुरा परिधि २४.९० मि. को रहेको छ।

१२. Recording:

Photography, Measurement, Drawing र प्रतिवेदन लेखन (Report Writing) पुरातात्विक कार्यको महत्वपूर्ण Recording System भएकोले विस्तृत फोटोग्राफी, नाप साध, र प्रतिवेदन लेखन कार्य गरिएको छ। समयको अभाव र वर्षात्को कारणले Drawing सम्भव भएन।

(क) फोटोग्राफी :

नक्सा (Drawing) को अभावमा पनि यस संरक्षण कार्यको रेकर्ड राम्रोसंग रहोस्, फोटोको माध्यमबाट त्यहाँको वास्तविकताको बारेमा पछिसम्म बुझ्न सकियोस् भन्ने उद्देश्यले त्यहाँ भएको सम्पूर्ण कार्यलाई तीन चरणमा विभाजन गरी फोटोग्राफी गरिएको छ।

- (अ) प्रथम चरण : कार्य शुरु हुनुभन्दा अगाडिको जस्ताको तस्तै अवस्थाको फोटोग्राफ्स।
- (आ) दोस्रो चरण : कार्य प्रारम्भ सरसफाईदेखि - कार्य पूर्ण सम्पन्न हुँदासम्मको विभिन्न अवस्थाको र अन्य सम्बन्धित कामहरूको फोटोग्राफ्स।
- (इ) तेस्रो चरण : संरक्षण कार्य सम्पन्न भएपछिको पूर्ण View र सबै Angle बाटको फोटोग्राफ्स।
फोटो प्रतिवेदनको आवश्यक ठाउँहरूमा राखिएको छ।
(स्मरण रहोस् सफा फोटोहरू प्राप्त नभएकोले यो पत्रिकामा राख्न सकिएको छैन। अतः सम्पादक मण्डल क्षमा प्रार्थी छ।)

१३. संक्षेपमा :

ऐतिहासिक, सांस्कृतिक, धार्मिक तथा पुरातात्विक महत्व बोकेको धमनिहवा जोडी स्तूप राष्ट्रको अमूल्य निधि हो। यसको समुचित संरक्षण तथा विकास गर्न सकेमा यस क्षेत्रको धार्मिक, ऐतिहासिक, सांस्कृतिक तथा पुरातात्विक महत्व उजागर हुनुका साथै पर्यटकीय विकास हुन गई आर्थिक दृष्टिकोणबाट स्थानीय जनता तथा राष्ट्रलाई नै टेवा पुग्न जाने कुरा सुनिश्चित छ। यी सबै कुरालाई ध्यानमा राखि हालसम्म पनि यस स्थलमा पुग्न बाटोसम्म नभएको धमनिहवा क्षेत्रको संरक्षण र विकासका लागि निम्न कुराहरू अविलम्ब हुन संक्षेपमा पेश गरिएको छ।

- (क) तिलौराकोटबाट धमनिहवासम्म पुग्ने बाटो तथा पार्किङको व्यवस्था।
- (ख) वाणगंगा नदीले कटान गर्न सक्ने सम्भावनालाई सम्बन्धित निकायले समयमा नै ध्यान पुऱ्याउनु पर्ने।
- (ग) भौतिक सुरक्षाको लागि तारबार, चौकिदार तथा क्वार्टरको व्यवस्था हुनुपर्ने।
- (घ) Site presentation map आवश्यक अनुसार ठाउँ-ठाउँमा राख्नुपर्ने।
- (ङ) तिलौराकोट र धमनिहवा स्तूपको बीचको खाली जमिन अबिलम्ब अधिग्रहण गर्नुपर्ने।
- (च) तिलौराकोट र यससंग सम्बन्धित क्षेत्रहरूको एकिकृत रूपमा विकास गर्न एक गुरुयोजना तयार गरी लागू गर्नुपर्ने।
- (छ) राष्ट्रिय तथा अन्तर्राष्ट्रिय क्षेत्रमा व्यापक रूपमा प्रचार प्रसार गर्नुपर्ने।

**१४. कार्याविधि र मुकाम :**

टोली २०६०।३।१ गते कार्यक्षेत्र धमनिहवा पुगी सोही दिनदेखि कार्य शुरु गरी २०६०।३।१६ मा कार्य सम्पन्न गरी २०६०।३।१७ गते लुम्बिनी विकास कोषको कार्यालय, लुम्बिनीमा हाजिर भएको थियो कार्याविधिभरि टोलीको मुकाम तिलौराकोटमा थियो ।

१५. अन्तमा :

सर्वप्रथमत यो कार्य गर्न अवसर प्रदान गरेकोमा र संरक्षण कार्यको शिलशिलामा आइपरेका विधिध समस्याहरुलाई सहज रुपबाट समाधान गरिदिएकोमा लुम्बिनी विकास कोषको व्यवस्थापन पक्षलाई धन्यवाद दिन चाहन्छौं ।

संरक्षण कार्यमा सम्पूर्ण कार्यको जिम्मेवारी बहन गर्नुहुने श्री कृष्ण बहादुर के.सी. र श्री ध्रुव नारायण पाण्डेका साथै फोटोग्राफर श्री अरविन्दमानसिंह शाक्य तथा सम्पूर्ण कामदार मित्रहरुलाई धन्यवाद दिदै यस प्रतिवेदनलाई Computerized गरिदिने कम्प्युटर अपरेटर श्री भिमबहादुर बस्नेतलाई पनि धन्यवाद दिन चाहन्छु ।

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- ५। रिजाल बाबुकृष्ण - Excavation Exploration and Other Archaeological Activities in Tilaurakot, 1972-73 प्राचीन नेपाल, संख्या २२, माघ २०२९, श्री ५ को सरकार, पुरातत्व विभाग ।
- ६। Archaeological Remains of Kapilvastu, Lumbini and Devadaha, 1979.

Happy New Year 2064 & Wish you all the best on the occasion of Buddha Jayanti

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LUMBINI: THE MASTER PLAN AND ITS IMPLEMENTATION

- Ruprama Rai

1. Introduction

Lumbini, the birthplace of Siddhartha Gautam, is situated in the Rupandehi District in the south-western plains of Nepal. In the 7th and 6th centuries B.C. Lumbini was renowned as a garden and its beauty was compared to the Chittalata (mind captivating) groves of Indra's paradise in heaven. At the time of his Mahaparinirvana at Kushinagara, Buddha recommended that all his faithful followers and devotees should visit his birthplace. Therefore, Lumbini has held a special significance as an important destination for pilgrimage and spiritual renewal worldwide.

The discovery of the Ashoka pillar by General Khadga Shamsheer Rana and Dr. A. Fuhrer in 1896 confirmed that Buddha was born in Lumbini. In 1956 King Mahendra Bir Bikram Shah Deva visited Lumbini and donated one million rupees to build infrastructure such as access roads and visitor facilities. A decade later, the then UN Secretary General U Thant visited Lumbini and called upon the international community to develop Lumbini. As a result, an International Committee for the Development of Lumbini was formed under the auspices of the United Nations in 1970. In the same year, His Majesty's Government of Nepal instituted the Lumbini Development Committee to co-ordinate the activities at national level. In 1985 the Committee became the Lumbini Development Trust (LDT).

In 1972, Prof. Kenzo Tange was given the responsibility to prepare the Master Plan. The basic orientation and functional layouts of the project were defined in the "Final Outline Design for Lumbini" compiled by Kenzo Tange and Urtec. The Master Plan was approved by HMG/Nepal and the United Nations in 1978, and envisaged the development of 1 mile x 1 mile rectangle, designating three major components from north to south: the New Lumbini Village, the Monastic Enclave and the Sacred Garden. The Master Plan also called for a zone of 25 square miles as protective area, buffer zone and agriculture zone.

2. BASIC CONCEPT

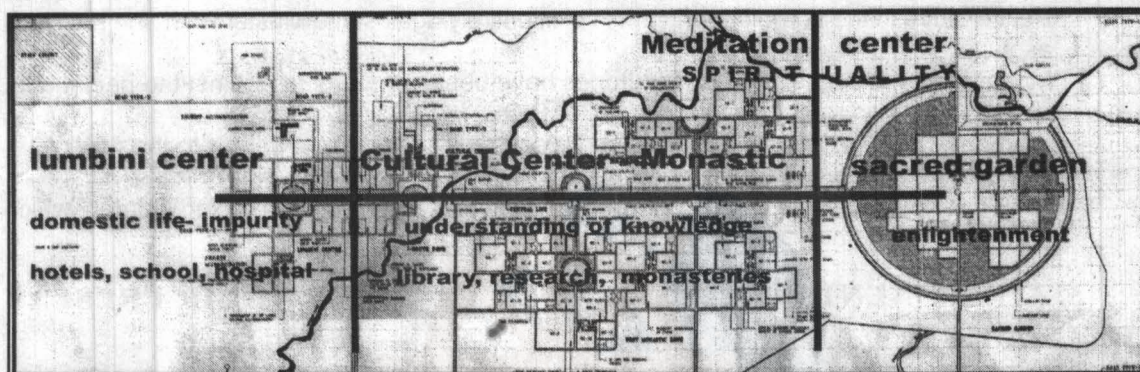
The Master Plan, prepared by the architect Prof. Kenzo Tange of Japan, was initially intended to be integrated in the Regional Development Plan of the Gandaki- Lumbini area. The development aimed to provide facilities for visitors to Lumbini and to support complementary activities such as monk's residencies, research, international meetings and teaching.

The Final Master Plan proposed in 1978 is focused on 7.7 sq. km centering on the Garden and the Ashoka Pillar, with an additional area of 64.5 sq. km to be developed in its support. The Lumbini Development Area is 5 miles, while the central 1 x 3 mile strip is divided into three 1x1 mile areas. The 1 x 3 mile strips on both sides of the central strip were designated. Restricted Areas. It was proposed that the concerned authorities should adopt zoning regulations for the additional 16 square mile area to act as a buffer zone that will assure the preservation of the agricultural environment. This area would be developed for agricultural purposes, and would provide food for local people and for visitors, thus helping to raise the standard of life for inhabitants.

The central 1 x 3 mile strip is divided into three components and each of the components has special significance as the Religious-Cultural-Tourism center. The design is oriented north-south, with Lumbini Village and Cultural Center to the north and the focus of the design- The Sacred Garden - to the south. On either side of the axis are the monastic enclaves, which are

surrounded by a green forest. The entire development is tied together by a central link comprising of a walkway and a canal. The Central Link is the major axis of the project, which establishes the solitude and sanctity of the Sacred Garden and offers pilgrims time and space to prepare as they approach the Sacred Garden.

According to Prof. Kenzo Tange, the overall intent is to reinforce the symbolic entity of the Lumbini Garden in its simplicity and clarity, as found in the layout of the Monastic Areas and the Sacred Garden. Moreover, the geometric interpretation of the Master Plan is based on religious symbolism. This symbolism in the master plan is an interpretation of both the philosophy of Buddhism and the requirements of the site. The Master Plan mainly consists of circles, squares and lines which are laid out with definite order, proportions and relationships to each other (fig. 1), as described below:



CIRCLE. The most predominant and basic form used in the Master Plan, representing the six aspects of Buddhism.

Square. Used along with the circle, representing the five aspects of Mahayana of Buddhism.

LINE. The main axis of the Master Plan, joining the center of the Sacred Pond, where Maya Devi took her bath, to the exact spot where the Lord Buddha was born.

The basis of the Master Plan and its development is related to the following three places associated with the event of the Birth of Lord Buddha:

- The Sacred Pond where Maya Devi took bath.
- The Tree whose branch she held while giving birth.
- The exact spot where the Buddha was born.

Prof. Kenzo Tange made every effort to emphasize the values of Lumbini through the Master Plan. This is evident from the components of the Master Plan which have been carefully laid out in direct relation to Buddhism. Thereby, anyone can imbibe the philosophy of Buddhism while taking a tour of the site. The main philosophy behind the hierarchy of activities and components, as conceived by Tange, is summarized below

The Lumbini Centre functions as an entrance complex to the ultimate destination, the Sacred Garden, birthplace of Lord Buddha. It consists of facilities such as hotels, schools, a hospital and administrative services, which represent worldly life. Therefore, this first component symbolizes the worldly life or impurity state of mind of the visitors. The second component is composed of the Cultural Center and the Monastic Zone, which symbolize the understanding of knowledge. The visitors seek knowledge through library and research center. Further on, the Monastic zone gives an insight into the life of the religious people. Therefore, the visitors get physically and



psychologically prepared to imbibe the religious values of the site. Before progressing towards the holiest place, the Sacred Garden, one passes through the Meditation Centers on either side of the entrance to the Sacred Garden. These Meditation Centers symbolize the spirituality or purification of the mind before entering the final destination. The Sacred Garden symbolizes the enlightenment, while the circular path from south to north symbolizes the path to nirvana or the attainment of final truth. Besides the practical reasons like environmental cooling and pleasing aesthetic, the circular water body around the Sacred Garden symbolizes the fluid inside the mother's womb. The river, which passes through the Master Plan area, symbolizes the umbilical cord, which connects a baby to the mother.

However, there have been some activities, which have violated the basic essence of the Master Plan. For instance:

- Peace Stupa in the Lumbini Center. It is built entirely against the Master Plan and technical aspects.
- Monastic Zone. Some of the monasteries have been constructed against the height and axial relations as mentioned in the Master Plan.
- Boundary Wall. Physically it is an eyesore and philosophically, a barrier to the flow of vibrations as per original Master Plan.
- Main Entrance. At present, the main entry point leads directly to the Sacred Garden, which is totally against the sanctity and purity of the site.

3. COMPONENTS OF THE MASTER PLAN AND THEIR PRESENT STATUS

The three main components in the Master Plan are based on religious, cultural, geographical and functional significance:

- Sacred Garden
- Monastic Enclave
- New Lumbini Village and Cultural Center

The Sacred Garden is the focal point of the Lumbini Garden area. It consists of archeological remains, a series of manmade lakes and a circular rampart that surrounds them. The complex is surrounded by a newly planted forest. It has the shape of a circle enclosing squares and represents the mystical universal symbol of purity and simplicity. Architecturally, no built structures are to be added to the garden except essential forms like offices, meditation cells, utility blocks and restored Mayadevi Temple.

The Monastic Enclave is situated in the forest area which lies outside the Central Link. It is composed of square plots, which are allocated to different countries for the construction of monasteries. Therefore, different architectural styles of monasteries coexist and symbolize religious harmony. There are two sects of monastic enclaves to represent Mahayana and Hinayana schools of Buddhism. The Monastic Enclave is unified by the careful integration of landscape elements such as plazas, entrance court, canals, boundary walls and circulation networks. The by-laws maintain a strict adherence to seclusion and spiritual aspects of monastic life to support the religious activities, thereby enhancing the spiritual values of the site.

The New Lumbini Village and the Cultural Center are situated in the northern segment of the entire site. This complex is the center for tourism and administration facilities of Lumbini. It is also the main entrance to the Master Plan area and the departure point for pilgrimages to the Ashoka Pillar.



3.1. Sacred Garden

3.1.1 Description as per Master Plan

According to Tange, the basic principle of design for the Sacred Garden is to create a quiet, natural environment by prohibiting the construction of new structures and by eliminating and relocating the existing structure, with the exception of the Ashokan Pillar. The Sacred Garden should be composed of the Sacred Area, the Tank Area and the Forest Area.

The Master Plan proposed to provide a very minimum of service facilities in the Sacred Garden Area for the pilgrims and tourists. The archaeological office and the utility block were to be constructed at eastern portion of the levee embankment.

In the design of the garden, two elements are incorporated: the unearthed ancient urban structure and a system grid for archaeological survey. The system for archaeological surveys consists of parallel roads running on 80m grid in either north-south or north-east directions. Each unit of an 80 x 80m lot is defined by the roads and forms a basic field unit for archaeological surveying. These roads will be utilized as service roads. The surface of the road is covered by topsoil with loose gravel. Potential areas for archaeological discovery are widely dispersed in the whole area and the construction of roads or levees should take this into account. When an unexpected discovery occurs in critical areas, the layout can be modified without altering the basic system. The modification may include the use of over bridge over significant archaeological remains. The use of bricks is strictly forbidden in the Sacred Areas.

The physical design of the sacred area is also conditioned by the technical need for water management. The dominant natural features of the site are the rivers: Harhawa, Ghoraha and Telar, which flow through it. They are mostly dry between October and May. During the rainy season, they flood the surrounding regions. As an integral component of the archaeological preservation plan, a circular levee link is to be built around the excavation area to protect from flooding. In order to conserve the natural aspect of Telar Nadi, which is itself a historical monument, a south east segment of the levee link would be modified to keep its natural shape.

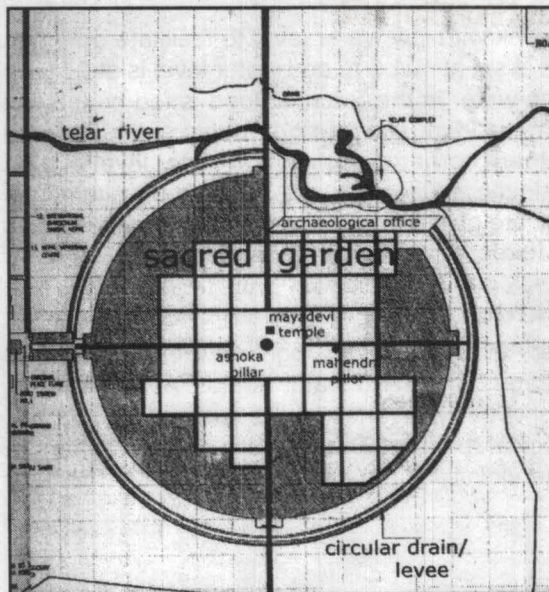
An excavated pond area lies inside the levee link with low water level to facilitate drainage from the excavation area. The level of the levee link is set at 101.5 m and water level is at 97.00m (3m below the base level of the Ashoka Pillar). The water in the Sacred Pond is fed by the link pond through a pipe. The water level of the link pond is 99m. The four quadrants of the tank are also interconnected. The gate structure at the southern corner maintains the water level at 97m during the dry and rainy seasons. On the top of the levee link is a 4m wide circuit road with edges lined with curb stones. Both sides of the circuit road are graded and they are surfaced with grass to provide a continuous foliage cover over the levee and to protect it from water erosion.

3.1.2. Present Status of the Sacred Garden

Proper and timely implementation of the Master Plan is necessary together with maintenance works of the garden with special concern to landscape details and water bodies. At present (fig. 2-3), the work is going steadily with the primary priority being given to the development of Sacred Garden include landscaping works of the archaeological remains. The relocation of the Mahendra Pillar and the dismantling of other structures in the vicinity of the site are planned for the near future, and should be completed in 10- 20 years.



S.N.	LIST OF ITEMS	REMARKS
1.	MAYADEVI TEMPLE	Completed
2.	ASHOKA PILLAR	Need of Restoration works
3.	MAHENDRA PILLAR	To be relocated to the Lumbini Center
4.	ARCHAEOLOGICAL OFFICE	Not started
5.	CIRCULAR LEVEE /CIRCULAR POND	Partial Completion
6.	CIRCULAR ROAD WITH CIRCULAR DRAIN	Partial Completed
7.	GATE VALVE (2no.s)	Partial Completed
8.	EXCAVATION OF ARCHAEOLOGICAL SITES	Delayed
5.	MEDITATION CELLS & WALKWAYS	Not started
7.	DISMANTLING OF OTHER STRUCTURES	Not started
8.	AFFORESTATION OF CIRCULAR LEVEE	Substantial Completion
9.	DEVELOPMENT OF SACRED GARDEN	Substantial Completion
9a.	TURFING	Will be completed by this year
9b.	ACCESS ROWS & DRAINAGE	Partial Completion
9c.	PONDS	
	NORTH EAST, NORTH WEST	Substantial Completion
	SOUTH EAST, SOUTH WEST	Partial Completion
10.	ROADS	
10.a.	ACCESS ROADS TO ASHOK PILLAR	Not started
	FROM 4 SIDES – 8m wide	
10.b.	PEDESTRIAN ROAD – 4m wide	Not started



It is also very important to control the water level of underground and flood water to protect and maintain the beauty of the Sacred Garden. The circular levees and outer circular canal works have been completed. Almost all earthworks required for the protection of the Sacred Garden are complete, but expensive works such as retaining wall of the tank inside the garden and gate structures are still to be done. Some earthworks in the sacred tank and landscaping in the garden are planned for the near future. List of partially completed works inside the Sacred Garden:

Earth cutting and Retaining walls.

- Outermost ring of trapezoidal drain channel
- Service roads from east and west of periphery roads
- Pedestrian path in the garden area.
- Gate structures to control the water level
- A forestation around levee and turfing.

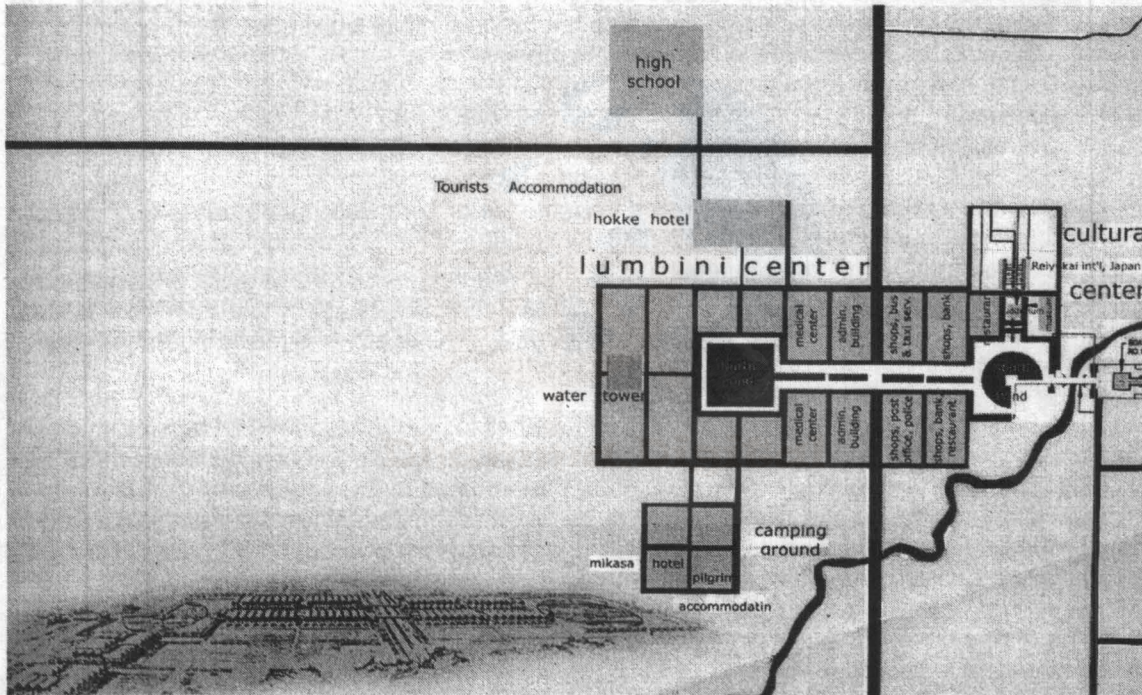


Besides the satisfactory progress in the development of the Master Plan, the main current problem is that the service road of the Sacred Garden is being used as the main entrance. This is visually disturbing for, and destroys the sanctity and purity of the Sacred Garden. The Vehicles that access this way destroy the harmony and essence of the site. Also, new structures like the temporary souvenir shops and restaurants should be planned in better way, in order to fit within the original planning concept.

3.2. New Lumbini Village and Cultural Centre

3.2.1. Description as per Master Plan

According to the Master Plan, the New Lumbini Village and the Cultural Center should be the main entry points to the site (fig.4). The focal point is on the intersection of the Bhairawa Taulihawa Highway and the north-south axis originating from the Ashoka Pillar. It is the monumental building element of the Master Plan. The functions allocated in these buildings are administrative, cultural and practical (ie accommodation for pilgrims and tourists). The whole complex is subdivided according to purpose as per Original Master Plan:



- A. New Lumbini Centre
- B. Cultural Centre
- C. Pilgrim's Accommodation Zone
- D. High School

These zones are supplemented by the following support facilities:
E. Road and Landscaping

A. New Lumbini Center

The Lumbini Center is located at the intersection of the Bhairawa-Taulihawa road, which is expected to be the principle approach route to Lumbini. It will function mainly for the service of the whole complex of the Master Plan. The Center consists of Administrative Facilities in the south:



- North Wing: administrative center, medical center, tourist information center:
- South Wing: security, post and telephone, banks, bus and taxi services, shops, restaurant.

A 16m wide canal lies along the central axis of the complex which forms a water supply network for the central link. The water depth is 65cm and the base is finished with un-reinforced concrete to improve water retention capacity. On both sides of the canal are 8m wide sidewalks with brick pavement. Along the side walk, a colonnade encloses the space of the central area. The colonnade is built in reinforced brick masonry construction on 4 x 4 structural modules. The colonnade in the north is connected with that in the south by an overbridge spanning the Bhairawa highway. The over bridge should be built in precast concrete. The outer edges of the colonnade are landscaped by a liner earth mound approximately 4m. high and 8m. wide.

B. Cultural Center

The Cultural Center is situated in the south of the Lumbini Center. The approach to the center is by pedestrian path along the colonnade. It is also directly accessible from the highway to its main entrance area, thus enabling it to be utilized independently from the Lumbini Center. This area is dedicated to world peace and is composed of three major buildings, which are intended to add to the cultural diversity of the activities at Lumbini:

1. Lumbini Museum
2. Auditorium
3. Library & Research Institution complex

The Lumbini Museum will house relics from the life of Lord Buddha gathered from all over the world. It will also include displays depicting the findings of the archaeological work done in the Sacred Garden and the history of Lumbini. The museum is made up of a central exhibition hall, surrounded by four mezzanine spaces and the ground floor space. The two mezzanine spaces on the west side and ground floor are for administration, workshop and laboratory for archaeological research. All remaining spaces are for the use of the public.

The Auditorium is envisaged as a multi-purpose hall to be used for national and international congresses. It includes balconies for press and observers, as well as a special balcony with annex facilities. The technical facilities of the Auditorium are located in the upper back wall of the hall, which includes booths for interpreters. The hall carries through the uniquely stylized architectural motif of the Lumbini Project on its four walls and acoustic considerations have been taken into account in the brickwork design.

The third element of Cultural Center is the Library and Research Institution complex. This will be a facility dedicated to the study of Buddhism and world peace, operating along the lines of advanced research institutions affiliated with many of the world's foremost universities. Renowned scholars will be invited to Lumbini to study and work with other researchers. The structure of the entire complex is similar to that of the Lumbini Center, a brick masonry construction on structural module. Given the need to accommodate larger spaces, the module is set on the double gird of 4 m and 8m.

C. Pilgrims Accommodation Zone

This zone provides accommodation to all types of tourists: high, middle or low income. Hence, everyone can visit and imbibe the values of Lumbini, irrespective of their socio-economic status.

Pilgrim's accommodations are planned on both sides of the northern pond. In the east is the



accommodation zone for high class tourists. The facilities planned in this zone for high class tourists. The facilities planned in this zone are similar to luxury resorts. The site, 80 x 160m, is providing with direct vehicular access from the Asian Highway, while the pedestrian access is from the northern pond area.

The Western accommodation zone is for middle class tourist and low-cost pilgrimage lodgings. Its lot size is 160 x 160m and it provides essential utilities such as drinking water, telephone and electricity services. These basic facilities are planned to provide a reasonably priced and comfortable stay for middle income tourists and pilgrims. The lot adjacent to this is utilized as a camping area for low cost lodging. Two units of camping ground will be constructed in the accommodation zone. The existing mango grove and the Harhawa River of the site have been chosen as a desirable natural feature around which a camping ground and picnic area are developed. In each unit, facilities like bathrooms and an amphitheatre, along with parking lots and rental shops, have been provided. In addition, the camping ground provides facilities like brick benches, fire places, etc.

D. High School

The High School is planned in the area between the branch from the Asian Highway and the eastern perimeter road. The site is selected for its accessibility from the surrounding communities and also for its relatively high altitude, away from possible inundation area. The school will accommodate classes from 4 to 10 standards for 800 students. A hostel and a head master's quarter are also included in the complex. This school also plans teaching of Buddhism for the local people.

It has been designed to reflect the conventional character through the use of exposed brickwork. The main aim of the design is to provide adequate ventilation in the classrooms and working area. Load bearing walls reinforced and buttressed wherever necessary is planned so as to reduce load transmission to interiors and also the use of large overhangs have been contemplated. The theme has been to develop a plan that tends to easy stage wise expansion and at the same time giving each stage a complete look.

E. Roads and Landscaping Works

The complex is directly accessible from the Bhairahawa-Taulihawa highway and each facility is served by a network of service roads and parking. There are vehicular roads (asphalt and gravel) and pedestrian paths (brick paved) providing access to each zone. Major landscaping elements consist of engineering elements, such as levee links along the Harhawa Nadi and boundary works along the roads as well as of architecturally treated mound works along the colonnades and pond areas. These landscaping elements, designed in close integration with nature, break the monotony of built up spaces.

3.2.2. Components and their present status

At present, not much progress has been made in implementing the works for this zone. Besides the building, major works in infrastructures such as roads, central canal and its subsidiary elements need to be constructed. These works have been delayed due to lack of financial resources and monumental character of the components; they cost more than the usual buildings. There have been some recent additions made to the original Master Plan, as listed below:

- Peace Stupa (Nipponzan Myohoji)
- Staff Colony
- Crane and Bird Sanctuary



Completed in 2001, the Lumbini Peace Pagoda was constructed by Nipponzan Myohoji Temple of Japan. This institute has constructed 73 stupas around the world and this is the highest one, with a diameter of 59 meter and the height of 41.5 meter. It is located behind the water tower aligned centrally to the central canal to the north of the Lumbini Center.

The staff colony was proposed for the personnel working with Lumbini Development Project, who are required to supervise and monitor the on going implementation of various components as envisaged in the Master Plan. The staff colony has been categorized into four grades, which could accommodate up to 200 staffs. It is located in the north east part of New Lumbini Village and under construction.

The Crane and Bird Sanctuary was established by the International Crane Foundation, in association with the World Conservation Union (ICUN) for the conservation and restoration of wetland biodiversity. Cranes are closely related to Lord Buddha as mentioned in Buddhist texts. It is planned in Lumbini Garden and artificial dykes, swamps are constructed to facilitate the conservation of birds and crane.

These recent additions have taken into consideration possible changes to the Master Plan. For instance, the Peace Stupa is aligned centrally to the axis of the Master Plan, without any direct connection to the Central Link. There is a new proposal for the central canal and walkways linking Peace Stupa to Lumbini Center. Similarly, there are new routes proposed in the Birds and Crane Conservation Zone to facilitate access for bird watchers.

The original concept of Master Plan is retained only after the proper development of Lumbini Center and Central Link. Till date, no works on the North and South Wings have started due to lack of resources. It is necessary that these structures, which are purely commercial and service-oriented, are built in time. Thereby, all activities, which are at present located in the Sacred Garden and are detrimental to sanctity and solitude of the garden, could be shifted. Also, the present main access to the site from the service road of the Sacred Garden should be stopped and resumed from the Lumbini Center as planned originally.

The components of the Cultural Center are designed as one entity with monumental character. Lumbini International Research Institute is the dominating complex of the Cultural Center. The Reiyukai, Japan provided funding for the construction of this complex under an agreement with LDT. It consists of functions like lecture rooms, library and study rooms for different language sections. This ever growing library has good collection of Buddhist texts, manuscripts, journals, research reports, etc in several languages and also publishes important manuscripts on Buddhism. This also provides lodging facility for serious researchers within a moderate payment.

Lumbini Museum, built with the financial assistance from Government of India, houses the relics of Buddha from all over the world since the ancient times. However, one of the components Auditorium hall (Peace Hall) remains to be built. The present emphasis should be made towards making the completed structures functional in order to motivate further development activities.

Of the three types of pilgrim accommodation, two types are functional while one is under construction. High standard pilgrim accommodation – Lumbini Hokke Hotel – and low standard pilgrim accommodation – Government of Sri Lanka – are completed, of these only the Lumbini Hokke Hotel is functioning while the low standard accommodation is not operating. LDT is trying to start operation of this accommodation unit. Meanwhile, the construction works of the middle income pilgrim accommodation – Mikasa Hotel – have been stopped. Almost 70% of the works



has been completed while the remaining works are pending due to a lack of initiative from the funding agency. Once completed, this unit, larger in scale and in close proximity of the Crane and Bird Sanctuary, could provide attractive accommodation options for tourists in Lumbini.

The camping grounds have not yet been established. Similarly, for the school only the foundation works have been completed. The remaining works is planned for the near future, depending on the availability of funds. Major works are to be done. Only basic earthworks for the central canal with plantations of trees on each side have been completed. The trees have grown to mature height but no further work has been done to incorporate the remaining landscaping elements. Major portions of the plan like pedestrian path, north and south pond, brick plazas around the pond, canals, and pedestrian path on both sides of the canal, colonnade construction, remain to be executed. Additionally, some of the completed asphalt roads need better maintenance, and the current gravel roads require as asphalt finish.

3.3. Monastic Zone

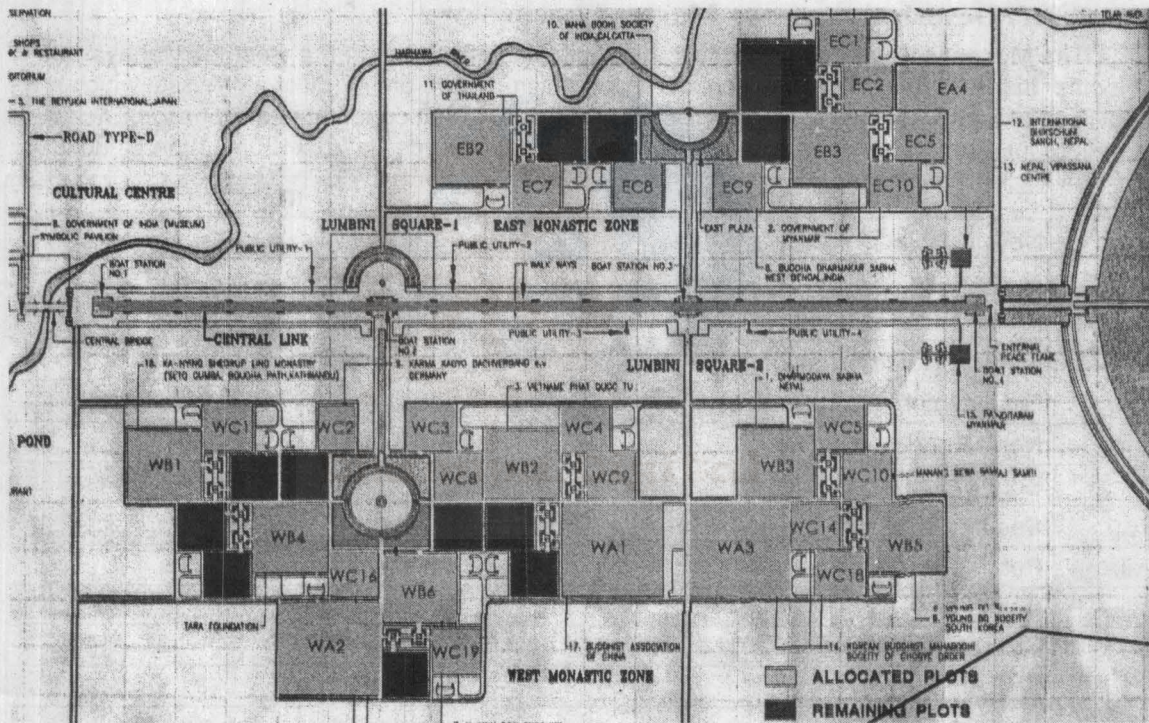
3.3.1. Description as per Master Plan

The Monastic Zone consists of two monastic enclaves, one in the west for Mahayana and the other in the east for Hinayana schools of Buddhism. There are 42 plots at the site, which have provision of future extension of upto 104 plots. Each unit that constitutes a Monastic Enclave is a square lot and is one of three types: type A: 160x160m, Type B: 120x120m, Type C: 80x80m.

S.N.	LIST OF ITEMS	REMARKS
1.	New Lumbini Center	
1.1	North Wing	Not started
i.	Administrative Center	Not started
ii.	Medical Center	Not started
iii.	Tourist Information Center	Not started
iv.	North Pond	Not started
1.2	South Wing	
i.	Security	Not started
ii.	Post & Telephone	Not started
iii.	Banks	Not started
iv.	Bus & Taxi Service	Not started
v.	Shops	Not started
vi.	Restaurants	Not started
vii.	South Pond	Not started
2.	Cultural Center	
i.	Lumbini Museum (Government of India)	Complete & Functioning
ii.	Auditorium	Not started
iii.	Library & Research Institution Complex	Complete & Functioning
3.	Pilgrim Accommodation Zone	
i.	Mikasa Hotel (100 beds)	Partial Completion



S.N.	LIST OF ITEMS	REMARKS
ii.	Government of Sri Lanka (Pilgrim's rest)	Not Functioning Properly
iii.	Lumbini Hokke Hotel	Complete & Functioning
iv.	Camping Ground	Not Started
4.	High School Complex	Partial Completion
5.	Roads & Landscaping	Partial Completion
6.	Crane & Bird Sanctuary	
i.	International Crane Foundation, USA	International Crane Sanctuary
ii.	IUCN World Conservation Union	Conservation & Restoration of Wetland & Biodiversity
7.	Peace Stupa (Nipponzan Myohoji, Japan)	Completed



Each cluster is separated from the Central Link by a 160m buffer zone. The approach to each cluster will be marked by twin pavilions situated in the Lumbini Squares. Buildings of various styles co-exist, reflecting the traditional style of the nation or of the religious tradition that builds it.

A certain level of control will be exercise over the construction activities so as not to compromise the overall concept of the Master Plan:

- Within a 20m zone from the axis of the main pedestrian path, the Monastic Plaza and the Entrance Courts, construction of structure is prohibited to preserve the landscape effect of public domain;

- Height of the buildings is limited to 3 storeys (not exceeding than the average height of the



surrounding trees.)

Beside the by – laws, landscaping will be co-ordinate to unify the various styles. A Monastic Plaza made up of circular or semi- circular steps will be created in the centre of each Monastic Zone and will serve as a central gathering point and will have a symbolic sculpture placed in its centre. In order to maintain the visual consistency, each Monastic Enclave will be enclosed by a 2.25m high brick wall. Inside the brick wall, a hedge of identical height is planned to create a semi-circular open space with a stepped platform is to be provided: Monastic Plazas. These will symbolize the domain of each Monastic Area and the core of public activities in the area. All pedestrian paths emerge from the plaza to the Monastic Enclave entrance court. The Monastic Plaza is surrounded by the monastic periphery tank. It then flows back to the central canal through the pipe so that there is no stagnant water in the tank or the canal.

B. Entrance Court

Along the main pedestrian path, a system of courts forms an atrium space for each Monastic Enclave. These Entrance Courts are also rest areas for pedestrians. There are ten entrance courts, each one connected with the entrances of three or four monasteries and equipped with brick benches, hedges and rows of Sal trees. The Sal trees, traditionally associated with the Lumbini Garden, will visually identify the location of Entrance Court from the Pedestrian path. The responsibility of construction and maintenance of these courts should be given to the respective monasteries.

C. Canal and pedestrian path

The construction of this canal system is similar to the central canal of the Central Link area, except that it is less deep (0.5) than the 1m deep Central Canal. The water in the canal is fed through an opening in the central canal. The pedestrian path and the landscape are the same as for the central canal. This system is the main thoroughfare of the monastic zones.

D. Fence Wall

All the monasteries will have a boundary wall. There are two types: main plan or decorative and secondary walls. The decorative walls will have flower beds provided on the exposed faces of the entrance courts and the monastic plazas. Plain walls will be built on the other sides of the monasteries. Hedges will be planted along the inside walls.

E. Circulation Networks

The circulation network in the Monastic Zone consists of main and secondary networks of pedestrian paths and of the vehicular service network.

E.1. Main pedestrian path

The main pedestrian path, main distribution link to each Monastic Enclave, is an 8m wide walkway with brick paving. Each main pedestrian path originates from the Monastic Plaza and leads to the Entrance Courts. Both sides of the path are defined by a 2.25 m brick wall and the axis of movement is visually felt by the symbolic pavilion in the Monastic Plaza.

E.2. Secondary pedestrian path

The secondary pedestrian path is a 4m wide walkway with brick paving. It provides the circulation networks between monasteries.



E.3. Service road

Vehicular traffic and services to the Monastic Area are provided by perimeter road on the edge of the Sacred Garden site and brought into the Monastic Area by a 6m wide road with asphalt paving over a gravel sub-base. The service road is connected to each service yard so that every Monastic Enclave is directly accessible. The service yard can also be utilized as parking space.

3.3.2. Present status of the Monastic Zone

At present, the Mahayana West consists of 29 plots, of which 21 plots are allocated, while the Theravada East consists of 13 plots, of which 9 plots are allocated. Out of 30 allocated. Out of 30 allocated plots, only 10 monasteries have been completed while 12 plots are undergoing construction. The works have not been started in the remaining 12 plots. There are 4 plots which have been allocated, but the agreements have not yet been signed. The monastic zones have achieved some architectural styles of their own but until now they have failed to adhere with the desired population density mentioned in the Master Plan.

The by- laws clearly rule the layout, their height of buildings, the design for boundary walls and the open spaces to unify the various components of monastic zone. But, some monasteries have been constructed against the inherent harmony and essence of the original Master Plan. For instance, the height of the building should not exceed than that of the surrounding trees although some of the monasteries are built 3 stories high and plan to go higher. Similarly, many monasteries have not followed the design of the boundary wall and of the layout of the spaces, as mentioned in the master plan.

As mentioned in the Monastic by- laws: "Normally, only a single plot shall be made available to a single Party. The Trust shall, upon taking into account factors such as the demand, objective and requirement of the concerned party, decide as to what type of plot shall be provided to the applicant". In spite of this, more than one plot has been allocated to some countries, and there is no clear demarcation between monasteries and their adjacent open spaces. Hence, some monasteries have occupied the green area outside their plot. "The trust shall initiate to gradually make available the following physical facilities from the trust to each plot subject to resources and means of His Majesty's Government – arrangement of drinking water, electricity line, telephone line, sewerage and road", At present the LDT has not been able to carry out the major works of infrastructure and landscape. The landscaping works and site development works are lagging far behind in comparison to the increased construction activities in the Monastic Zone. This has resulted in unsequential development where magnificent monasteries are built by respective countries without proper provision of infrastructure, open spaces and parking as planned in the Master Plan.

"The responsibility of the operation, maintenance and cleaning of building and land situated in each plot shall be of tile lessee. The concerned lessee shall construct and maintain the parking and greenery area allotted in the Monastery area". However, LDT has been ineffective in monitoring building activities of the monasteries and to mobilize funds for the general development of the site in timely and proper manner as per Master Plan.

"Construction works shall be commenced within six months of getting permission pursuant sub rule (3) and construction works shall be completed within three years from commencement of the construction works", however, some monasteries have delayed their construction works for more than 3 years, while others have been abandoned or stopped for a long time. Therefore LDT has not been able to monitor the proper implementation of the by-laws in many aspects of the

works from initial to final completion stages. Following is an outline of completed monasteries of each zone:

A. East Monastic Zone

- Government of Thailand (EB-2 & EC-7)

It consists of a temple, residence units and buildings for religious purposes. The complex is designed in Thai style, but the design of its boundary wall does not adhere to the Master Plan.

- Government of Myanmar (EB-3 & EC-10)

The complex is built in Burmese architectural style but its design of boundary wall does not adhere to the Master Plan.

- Government of Sri Lanka (EC-1 & EC-2)

It is built over two plots and construction is ongoing though delayed by the lack of funding by its Government, built in Sri Lankan architectural style. It consists of a monastery and a temple. No boundary wall is made.

S.N.	LIST OF ITEMS	Completion	REMARKS
1.	WEST MONASTIC ZONE		
1.1	TYPE A-160m X 160m		
i.	WA-1	Completed	Buddhist Association of China
ii.	WA-2	Under Construction	Sokyo Organization, Japan
iii.	WA-3	Under Construction	Korean Buddhist Mahabodhi Society
1.2.	TYPE B-120m X 120m		
i.	WB-1	Not started	Ka-Nying Shedrup Ling Monastery
ii.	WA-2	Under Construction	Phat Quoc tu, Vietnam
iii.	WA-3	Under Construction	Dharmodaya Sabha, Nepal
iv.	WA-4	Completed	Tara Foundation Duesseldorf, Germany
v.	WA-5	Storehouse completed	Yong Do Society, South Korea
vi.	WA-6	Under Construction	W. Linh Son Buddhist, France
1.3	TYPE C-80m X80m		
i.	WC-1	Not started	Zarong Thupten Mendol Dogna Choling, Nepal
ii.	WC-2	Boundary wall Const.	Karma Kagvud Dachverband, Germany
iii.	WC-3	Agreement not signed	Royal Government of Bhutan
iv.	WC-4	Agreement not signed	Republic of Mongolia
v.	WC-5	Not started	Karma Lekshey Ling Institute
vi.	WC-6	Remaining	
vii.	WC-7	Remaining	
viii.	WC-8	Agreement not signed	Royal Government of Bhutan
ix.	WC-9	Under Construction	Gaden International, Austria



S.N.	LIST OF ITEMS	Completion	REMARKS
x.	WC-10	Completed	Manang Sewa Samiti, Nepal
xi.	WC-11	Remaining	Gedan International
xii.	WC-12	Remaining	
xiii.	WC-13	Remaining	
xiv.	WC-14	Under Construction	Korean Buddhist Mahabodhi Society
xv.	WC-15	Remaining	
xvi.	WC-16	Completed	Drigung Kagyud Meditation Center, Ladak
xvii.	WC-17	Remaining	
xviii.	WC-18	Under Construction	Korean Buddhist Mahabodhi Society
xix.	WC-19	Agreement not signed	Kuching Buddhist Society (Malaysia)
xx.	WC-20	Remaining	
1.4.	West Plaza		Not started
2.	EAST MONASTIC ZONE		
2.2.	TYPE B -120m X 120m		
i.	EB-1	Remaining	
ii.	EB-2	Completed	Government of Thailand
iii.	EB-3	Completed	Government of Myanmar
2.3.	TYPE C-80m X 80m		
i.	EC-1	Under construction	Government of Sri Lanka
ii.	EC-2	Under construction	Government of Sri Lanka
iii.	EC-3	Remaining	
iv.	EC-4	Remaining	
v.	EC-5	Remaining	
vi.	EC-6	Completed	International Bhikkhuni Sangh, Nepal
vii.	EC-7	Completed	Government of Thailand
viii.	EC-8	Completed	Maha Bodhi Society of India, Calcutta
ix.	EC-9	Under construction	Buddha Dharmakur Sabha West Bengal, India
x.	EC-10	Completed	Government of Myanmar
2.4.	East Plaza		Not started
3.	CIRCULATION NETWORKS		
3.1	Main Pedestrian Path		Partial Completion
3.2.	Secondary Pedestrian Path		Partial Completion
3.3.	Service Roads		Partial Completion

**International Nun Centre, Nepal (EC-6)**

1. It consists of a monastery and a temple. Its styles do not exhibit any Nepali architectural character and design of its boundary wall does not adhere to the Master Plan.

-Maha Bodhi Society of India, Calcutta (EC-8)

It consists of a temple and a hall, and it is built in any typical architectural character. Its boundary wall does not adhere to the Master Plan.

- Zhong Hua Monastery, Buddhist Association of China Built in Chinese architectural style, its large building volume and its boundary wall are not as per the Master Plan. It consists of a temple, a monastery and buildings for religious purposes.
- Sokyo Organization, Japan (WA-2). Built in Japanese architectural Style, its construction has been stopped. No boundary wall has been made.
- Korean Buddhist Mahabodhi Society (WA-3, WC-14&WC-18). Built in Korean architectural style, it occupies more plots that should be allocated and it is being constructed against the by-laws. It consists of a monastery and a guesthouse. The guesthouse is operating, while the monastery is half way completed.
- Phat Quoc tu, Vietnam (WB-2). Built in Vietnamese architectural style, it consists of an office, a guesthouse and a temple.
- Dharmodaya Sabha, Nepal (WB-3). This plot is shared by three sects of Buddhism: Mahayana, Bajrayana and Theravada. Out of these, the Mahayana has completed its monastery and its separate boundary wall, while the construction of Bajrayana sect building is underway. Built in Buddhist architectural style, its boundary wall does not follow the Master Plan.
- Tara Foundation Duesseldorf, Germany (WB-4). Built in Buddhist architectural style, it consists of a temple, a monastery and buildings for religious purpose. Its boundary wall is not as per Master Plan.
- Yong Do Society: South Korea (WB-5). Only a storehouse and staff quarters have been completed.
- W.Linh Son Buddhist, France (WB-6). Built in French architectural style, it is partially completed although works have been stopped.
- Karma Kagyud Dachverband, Germany (WC-2). The plot has been allocated, but the construction is yet to start. The boundary wall has been built, which is not as per master plan.
- Manang Sewa Samiti, Nepal (WC-10). It is built in Buddhist architectural style and is complete.
- Drigung Kagyud Meditation Center, Ladak (WC-16). It is Built in Buddhist architectural styles and completed.

3.4. Other Elements**3.4.1. Description as per Master Plan**

The Master Plan for Lumbini was developed based on the very basic and essential themes of Buddhism. The entire site area has been integrated within an area of 1x3 miles which is subsided into the linear grid of 80x80m. The development mainly consists of straight lines, circles and squares of definite proportions. The landscape elements follow the same guidelines to maintain the integral harmony and to complement all other physical structures. The landscape and the associated architecture help to balance the monotony created by the imposed guidelines and physical structures.

The Central Link constitutes a public circulation corridor connecting the Lumbini Center to



the north and the Sacred Garden to the south. Its total length extends for 1,400m with a constant width of 64m. The central water body provides a cooling effect against high temperatures in Lumbini, while the greenery provides shade from the sun. Its design, with various structures and landscape elements prepares the visitors psychologically for their visit to the Sacred Garden. It consists of four major features: A 16m wide water body; a 16m wide pedestrian path on both sides of the canal, rows of trees at the edge of the pedestrian path and 8m wide green hedge followed by forest.

A. Levels

The upper level of the Lumbini Centre, the central link bridge, is set at 104.5m above sea level, having taken into consideration the flood level of Harhawa Nadi. The level of the northernmost edge of the link is set at 103.75m to function as a levee against the inundation of the Harhawa Nadi. The south end of the link is set an altitude of 101.5m, which is above the inundation level and identical in level to the top of the perimeter levee of the Sacred Garden. The water level of the Central Canal is set at 101.25m below the levee level.

In order to adjust the existing natural contour to the level of the Central Link: three different sections are planned for the central link: from the north end complex to the Lumbini Square 1, the section consists of 3 steps (101.5m, 102.25m, 103m); from the Lumbini Square 1 to the Lumbini Square 2, two levels (101.5m, 102.25m); from the Lumbini Square 2 to the South end Complex, the altitude is uniform at 101.5m. East level is connected to the others by a system of ramps and stairways.

B. Central Canal

Along the central axis of the link is situated the Central Canal about 12m wide and 1.25m deep. Both edges of the Canal are provided with 2m wide platforms at the level of 101.00m with 25cm water depth. These platforms are provided to secure pedestrians from the danger of fall into the Canal, while avoiding visually unfavorable parapet along the edges of the Canal.

The base of Canal is finished with thin layer of concrete to maintain the water retention capacity of the Canal. The surface of the pedestrian paths and the platforms are to be paved with brick. Between the pedestrian paths and the forest area outside the link will be 8m strip of grassland marking the border of both zones. The pedestrian path is sloped towards the forest to drain out the rainwater into the forest so that the canal water does not become dirty.

As a part of the pedestrian path, 'Kadamba' trees spaced at 16m apart on either side provide an impression of a wide confined lane and shade to pedestrians during summer. The pedestrian paths are also facilitated on either side of the central canal by a cluster of four soil-brick benches at every 80m center to center enclosing a rectangular open space for pedestrians to rest. Similarly, the dustbins, water fountains and light posts are arranged between 'Kadamba' trees.

The canal that runs along the middle of the Central Link will be provided with boats for transportation for the aged and handicapped visitors. Small local boats will be utilized. Boat stations and mooring posts with a large water surface for anchorage will be provided along the link. At the boat stations at the entrance of Lumbini square 1 and 2, twin bridges will be connect both sides of the canal.

The boats are considered a moving landscaping element within the Central Link, which will be further enhanced by the continuous movement of people. The entire length of the Central Link



is to be broken into three sections of equal lengths by Boat Station 1, Lumbini Square 1, Lumbini Square 2 and Boat Station 4 (from north to south). Each of the squares is to be centered on a symbolic sculpture.

C. Planting

Both edges of the Central Link are defined by the forest area. To sustain the vista from the Central Link, such species known for their flowers will be planted. They may include: *Saracca indica*, *Cassia fistula*, *Delonix regia*, *Accasia javonica*, *Shorea robusta*. In front of the forest edge, rows of tall trees are to be planted on 16m module to form street-side trees. In accordance with the recommendation by HMGN-Forest Department, the *Anthocephalus cadamba*, usually referred to as *cadam* is chosen because of its landscape effects, growth speed and availability.

D. Nodes

At both ends of Central Link and at two of the locations subdividing the link into three Parts, there are four nodal points of the link: from north, the north end complex, the Lumbini center 1, the Lumbini center 2, and the south end complex. The approach to the north end complex is by way of the Lumbini Center- Central Link Bridge spanned over the Harhawa Nadi, while the connection to the south end complex is through the Central Link-Sacred Garden Bridge.

E. North End and South End Complexes

These two complexes form the gate to the Central Link and in each a pair of pavilions symbolizes the gateway. They are provided with boat stations and mooring posts with a large water surface for anchoring. The symbolic pavilion type 1 serves as an entrance to the north and south pond, whereas the symbolic pavilion type 2 serves as an entrance to the Central Link. The pavilions are provided with water fountain, toilets and benches. In total there are 8 symbolic pavilions of type 1 and 4 of type 2.

F. Meditation Centers

There are two Meditation Centers on each side of the Central Link. One is for the Hinayana sect, the other is for the Mahayana sect. Each meditation area is a 40x40m grass covered square defined on all edges by forest trees. The recurring motif of the square and circle and unit module system as per the Master plan has been adhered to. This motif has been reflected in the plan of the building and also in the structural system, especially in the assembly hall and meditation cells. The purpose of planning a single storey building with load bearing walls is to maintain a low profile to match with the overall intent of tranquility. Simplicity in design, based on a convenient and uniform grid, has been followed.

G. Lumbini Squares 1 & 2

The Lumbini Squares 1 and 2 are the gateways to the Monastic Areas. Each is marked by a pair of symbolic pavilions, which are equipped with water fountains. The boat station for each square is marked by twin bridges which connect the two sides of the canal. The square themselves are large paved surfaces for public gathering. To ensure a good view, the edge of the Square is stepped up in a gentle slope. At the focal point of each square there is space for a large symbolic sculpture, along the lines of the Mahendra Pillar, to be placed.

3.4.2. Present status of the other elements

None of the above-mentioned works have been started except from a few basic works (fig. 17). The Central Canal, the main linkage that physically and psychologically unifies the Master

Plan, has been partially excavated. It is of utmost importance that development works start on the Central Canal for the full realization of the Master Plan.

S.N.	LIST OF ITEMS	REMARKS
1.	CENTRAL LINK	
1.1	Central Canal	Partial completion
1.2	Grassland Mark	Not started
1.3	Plantation	Partial completion
1.4	Boat Station No.1, 2, 3, 4	Not started
1.5	Benches & Dustbins	Not started
1.6	Lumbini Squares 1 & 2	Not started
1.7	Twin Bridge at Lumbini Squares 1 & 2	Not started
1.8	Public Utility 1, 2, 3, 4	Not started
2	SYMBOLIC PAVILIONS	
2.1	Symbolic Pavilion Type 1	
i	Lumbini Squares 1 & 2	Not started
ii	North & South ends of the colonnades around the North & South Pond	Not started
2.2	Symbolic Pavilion Type 2-4 no.s	Not started
i	North & South end complexes of Central Link	Not started
3	MEDITATION CENTERS	
3.1	Panditarama Meditation Center, Myanmar	Completed
3.2	Nepal Vipassana Centre	Under construction-50% completed
4	Staff colony	Completed, few blocks remaining

The trees planted along the Central Link have grown to mature heights, but they seem lost due to the lack of proper development of the rest of the landscape. The original purpose of water in the central canal, as means of transportation by boat, can only be fulfilled after the construction of the water tower. However, the LDT has no immediate planning for this construction. The existing water bodies are now supplied through a temporary supply system. None of the lined works such as the north and south ponds, plazas and central canal have been carried out completely.

The Master plan has envisaged public spaces and plazas to accommodate visitors during functions and gatherings in Lumbini. However, necessary facilities such as toilets, drinking water facilities, resting places and appropriate landscape elements are not yet established. Extensive plantations have been carried out in the Project area including the forest areas. However, lots of plantation works need to be done to suit specific need and purposes. The roads, pedestrian walkways and plazas need to be planted with trees and vegetation of suitable height, with respect to varied widths and aesthetic purposes of the roads and pavements. Hence, at present there is no continuity in physical structures and landscape elements from the Lumbini Center to the Sacred Garden as proposed by the Master Plan.

The land for the Meditation Centre in the Master Plan is allocated to two countries. One, belonging to the Nepal Vipassana Centre, occupies an 80×80m plot, and is now under construction.



The other plot belongs to the Panditarama Meditation Center of Myanmar, occupies 80×200m plot and is completed. Both are functioning well as meditation centers.

3.5 Infrastructure

3.5.1 Description as per Master Plan

A. Roads

The Master Plan envisages construction of two basic categories of roads with their sub-divisions depending of roads with their sub-divisions depending on their utility and location.

S.N.	LIST OF ITEMS	REMARKS
1	PEDESTRIAN PATH	
1.1	Main Pedestrian Path-8m wide	Partial completion
1.2	Secondary Pedestrian Path-4m wide	Not started
1.3	Pedestrian Path-2m wide	Not started
2	METALLIC ROADS	
2.1	Link Road to Asian Highway-15Y40 to×15Y60	Partial completion
2.2	Periphery Road	Partial completion
2.3	Road network in Lumbini Centre & Cultural Centre	Partial completion
3	SERVICE ROADS	
3.1	Service Roads-6m wide	Partial completion
3.2	Circular Levee Road-4m wide	Partial completion
4	PARKING LOTS	Not started

A1. Metallic Roads. Metallic Roads consists of paved roads with asphalt surfacing. The total length of the metallic roads is 18,680m. However, the Project Profile prepared by LDT indicates that the total length of the metallic roads is 20.8 km. Altogether there are 3 types of metallic roads:

- Link road to the Asian Highway. This road has been designed as a 10m wide black top road with 1.5m of green space on the either side. Following the green space on the either side of the road is 2m wide pedestrian path. There is also provision for lamp posts in between the trees planted along the green space on the both sides of the roads;
- Periphery road. The periphery road is designed in the form of an embankment around the boundary of the project from flooding. The road is designed to serve as the diversion road to the public because if the discontinuation of the existing old road through the project. It is planned as 10m wide with beams on either side of the road and will have lamp posts and trees all along its length;
- Roads in the Lumbini Centre and Cultural Centre. The Road network in and around the Lumbini Centre and the Cultural Centre is planned in the form of an embankment with parking facilities. This road is of 8m wide as the metallic portion and has a 2m wide pedestrian path on both sides.

A2. Service Roads. Apart from highways and main roads, the Lumbini Master Plan contains provision for the construction of service roads, which will join all components of the Master Plan. Vehicular traffic and service to the Monastic Area is by way of perimeter road on the edge of the Sacred Garden site.

The service road is connected to each service yard, providing access to each Monastic



Enclave. The service roads are designed in the form of embankments finished with gravel and linked with concrete curbstone to define edges of the road. The service road network is provided at the Lumbini Centre, at the

East and West Monastic Zones and at the Sacred Garden. These roads are designed as double lanes for main and single lanes for feeder roads. The double lane roads are planned to be 10m wide. The single lane road will be 6m wide. Vehicular traffic and services to the Monastic area are by way of perimeter roads on the edge of the Sacred Garden site and are brought into the Monastic area by 6m wide road.

B. Parking lots

The Master Plan envisages the construction of Parking spaces at various locations:

- Lumbini and Cultural Centre: Altogether 10 parking plots are envisaged in the Master Plan. Out of these 10 locations, 8 are meant for cars and light vehicles and two are meant for buses. The individual parking capacity of each car park is 44 vehicles and the parking capacity of each bus park is 6 buses. In addition to the above, parking lots are also provided for the tourist accommodation (Hokke Hotel), high school and central plaza;
- Monastic Zone: of the 19 parking places, 16 have a capacity for 17 vehicles and 3 have a capacity of 34 vehicles;
- Sacred Garden: a parking lot is provided in the Sacred Garden area. The capacity is 5 vehicles.

C. Pedestrian walkways

The Master Plan envisages construction of four categories of pedestrian paths. All the planned paths consist of flat brick soiling, cement concrete cushion and are finished with brick on the edge laid in strait bond. The pedestrian path that links the Lumbini Centre and the Sacred Garden is planned to be constructed on the both sides of the Central Canal. Similarly, the paths linking Lumbini Squares with the Monastic Plazas are to be 8m wide. The main pedestrian path within the Monastic Plaza is to be 8m wide. Each Monastic Enclave is surrounded by 4m wide walkways. The pedestrian paths within the Sacred Garden are to be in natural ground.

At present, only partial works has been done for the roads proposed in the Master Plan. Some of the completed peripheral asphalt roads need rehabilitation while for parts of the service and vehicular roads only the gravel work has been completed. Except for levee surrounding the Sacred Garden, none of the walkways envisaged by the master plan have been constructed. The walkway on both bank of the central canal is supposed to be brick paved. However, at present only the gravel surface is provided. Inside the monument zone, only basic earthworks have been done to demarcate pedestrian networks. The walkways inside the Sacred Garden are partially completed and there are no formal parking lots constructed inside the Master Plan area. There used to be parking arrangements for vehicles at the east and south west of the Sacred Garden, however, this is no longer allowed. One of the parking lots inside the Lumbini Centre is under construction.

D. Flood control

There are four (Harhawa, Ghoraha, Telar and Nadia) rivulets/drains flowing inside the project area. The Harhawa River bisects the whole area and affects all the construction works of Lumbini Center, the Monastic Enclave and the Central Link. The Ghoraha River bisects the Sacred Garden. This river flowing in the project area has too small cross sections to carry high flood discharge during the rainy season. Thus, a vast land is often flooded especially in the southern parts, where the existing Lumbini Garden is located. The Master Plan has envisaged channelization, widening and protection of all four rivers. The drainage plan envisages protecting the Monastic Zone, Tourist



Accommodation Zone, Sacred Area and the major structures.

D1. River Diversion and Improvement

The diversion and improvement of the existing rivers has been planned after taking into consideration the flood frequency analysis and are further based on the meteorological and hydrological data, and on watershed parameters. The Harhawa River develops a typical flood plain of 120-200m in width, 1-2m below the surrounding ground along the river course. This natural flood plain provides an adequate flow section to drain the flood discharges. Therefore, no river improvement is intended except in the portions where the structures are to be located. Design flood magnitude at different return periods by various methods has been derived to improve the river channel at different locations and to divert it at four other locations for a steady flow. The straightening of the river shortens the length and consequently creates a higher gradient of the natural widening channel. The gradient has been designed to improve the river flow.

D2. Inundation Control for the Sacred Garden

The southern part of the Project Area, where the existing Lumbini garden is located, is inundated several times a year due to the flooding of the Telar River. As the Telar River does not have sufficient channel capacity, the excess water overflows the banks and consequently inundation occurs. Therefore, the design provides for excavation of the slope of the bed and for the widening of the channels. The water surface elevations are estimated at 10m and 99m respectively under the expected maximum and the annual inundation conditions. Therefore, the Garden is planned to be surrounded by a levee ring with a crest elevation of 101.5m. The acreage inside the levee ring is about 58ha, consisting of the sacred area (33ha) and pond area (25ha). In order to keep the level of water in the pond low enough to prevent the archaeological relics from inundation, two drainage gate structures should be constructed at the southern corner. Each structure consists of a steel gate, 1.5m high, 2m wide, so that they can spill out the excess water caused by the daily maximum rainfall of 402mm per day. In addition, the Ghoraha River has been diverted to the outside of the levee ring around the sacred garden by being connected to a drainage channel which in turn is connected to the Telar River near the southern boundary of the project Area.

D3. Levee Embankment

The levee embankment has been designed from the watershed pattern and river flow system to protect the East and West Monastic Zone, Lumbini Center and Cultural Center. The East and West Monastic Zones have been designed as raised platforms at an elevation of 100.7m. The levee embankment is also planned to protect the Lumbini Center and Cultural Center.

In addition to the measures mentioned above, the following plans can be considered to eliminate inundation completely from the project area: - Diversion of the flood discharge of the Harhawa river to the Telar River along the western boundary of project area.

Diversion of the drainage basin of the Telar River to the Koilahawa River.

These plans will be quite effective for reducing the flood discharge. However, they are so costly that more investigations and studies will be required. At present, although the river improvement works inside the project area have already been completed, the flood problem remains. It is therefore, essential that river improvement works outside the project area are undertaken. The proposed diversion of a part of the flood water of the Telar River to the Koilahawa River has been evaluated. However, this project has been delayed due to problems created by land acquisition and lack of support from the local people. The following works for river improvement have been partially completed:



- Channelization and cross section enlargement of Harhawa River at four locations with 60% completion of earthwork;
- Diversion of Ghoraha River outside the Circular Levee in the Sacred Garden area and channelization of small Nadia drain;
- Section enlargement of Telar in some places is being carried out.

The Sacred Garden is surrounded by a circular levee with a design crest elevation about 95.5 m. The drainage canal outside the levee ring is substantially completed, providing protection to the inner levee ring. The following works for inundation control for the Sacred Garden have yet to be carried out:

- Improvement of out flowing drain culverts and gated structures are recommended for proper drainage plan of the Sacred Garden.
- Protection works and earthworks are recommended after carrying out a diversion of Ghoraha River.
- Protection and river improvement works are recommended after carrying out channelization and enlargement of the Harhawa River.

The structure proposed in the Master Plan for flood controls are adequate. However, problems seem to arise from a lack of proper implementation of the works identified by the Master Plan.

1	RIVER DIVERSION & IMPROVEMENT	
1.1	Channelization & cross section enlargement of Harahawa River at four locations	60-70% completion earthwork
1.2	Diversion of Ghorawa River outside the Circular Levee in the Sacred Garden Area.	Partial Completion
1.3	Channelization of small Nadia drain	Partial Completion
1.4	Section enlargement of Telar river at some place	Partial Completion
1.5	Other River Protection works	Not started
1.6	Western primary drainage canal	Partial Completion
1.7	Eastern primary drainage including Nadia nala and other drainage	Partial Completion
2	LEVEE EMBANKMENT	
2.1	Monastic Zone	Not started
2.2	Lumbini Center & Cultural Center	Not started

E. Water supply system

The main source of water supply is from deep boring, which is to be controlled by the centrally controlled water supply system. There are three deep boring wells planned. One is at the Sacred Garden near the Ashoka Pillar, from where the water is to be collected and distributed to the users inside the Sacred Garden. The others two borings are drilled in the northern part of the Master Plan. Water supplied from these two deep wells will be stored in an underground tank, which will be pumped up to the elevated tower for distribution to individual users inside the Lumbini Village and Monastic Enclave. All distribution lines are planned to be laid mainly along the walkways and pedestrian paths. The pipelines will be laid along the parapet wall of the Central Link Bridge to maintain the residual head of 15 m water column.

Until today, no progress has been made except the boring works.



E	WATER SUPPLY SYSTEM	Not started
F	SEWER SYSTEM & TREATMENT PLANT	Not started
G	ELECTRIC POWER SUPPLY SYSTEM	Not started
H	TELECOMMUNICATION	Not started, temporary mart system alive
I	WATER TOWER	
i	Overhead Tank	Not started
ii	Water Supply Network	Not started
iii	Reservoir	Not started

The completed Monasteries have already started digging their own wells for drinking water supply. This activity will affect the central water supply system and the water required for the canal will not be available. LDT should work towards implementation of central water supply system to prevent such individual deep boring.

F. Sewer systems & treatment plant

The Master Plan proposed the provision of sewer networking in the whole project area to collect night soil and kitchen wastes. The system also consists of a provision made to treat the collected wastes and for which a sewer treatment plant is proposed downstream from the Telar River for safe guarding the environment.

At present, all the existing units in the project area have their own septic tanks to trap the night soil and the kitchen waste of individual units is disposed directly in open air.

G. Electric power supply system

Electric power is supplied to the project area from a receiving station within the project area connected to three phase three wires in either 50Hz or 60Hz. The electric power supply in the project area is divided into three components:

- Laying of main electric lines
- Construction of sub-stations
- Erection and fixing of external illuminations.

The main electrical line is planned to be distributed through the main receiving sub-station near the Lumbini Center. All the low tension distribution electrical cable lines will be laid up to the boundary of each of the components. The load for each of the component has been computed in accordance with the standard norms. Apart from the main receiving sub-stations, construction and installation of thirteen distribution sub-station for low tension distribution electric power are planned. The construction of the sub-station is to facilitate the different clusters of the Master Plan for smooth and continuous supply of power. The Master Plan provides for illumination of the main road, parking lots, central canal and other places of importance. The position and distance of all the external illuminations have been fixed according to the requirements of lux power at different locations.

To date only a temporary electrification system has been established in the project area with the supply from the national grid, and the construction of the sub-station has been completed.

H. Telecommunications

The telecommunication service is planned to function within the project area and will be



linked with the national network for external communication. The telephone demand has been forecast according to the different facilities envisaged in the Master Plan, taking into account the growth potentials of tourists flow. 1000 telephone lines are planned to be distributed within the project area. At present, only temporary telecommunication services have been arranged.

I. Water tower

The Master Plan has made provision for the construction of the Water Tower. The water lifted from the deep tube wells will be supplied to the reservoir from where the water will be pumped to the elevated water tower. The drinking water requirements of each component of the Master Plan will be supplied through the tower by gravity drop. The chemical treatment plant is housed inside the Water Tower Complex.

At present, water is supplied from a temporary water supply network to a limited area of project from the existing tube well located adjacent to the Ashoka Pillar.

4. Implementation and Management

4.1. Implementation Period, 1970-85

The United Nations and the His Majesty's Government of Nepal undertook a study of the Lumbini Development Project in 1967. UNDP contributed nearly 1 million US dollars for the preparation of the Master Plan for the development of Lumbini, including numerous engineering and archaeological studies. The renowned Japanese Architect-Planner Prof. Kenzo Tange and Urtec were requested to prepare the Master Plan with an estimate cost of US\$ 6.5 million.

In 1972, Prof. Kenzo Tange and Urtec submitted the "Final Outline Design for Lumbini" which is a compilation of basic orientation and the functional layout of the project. In 1972, Nippon Koei, Sponsored by the Japan EXPO foundation submitted the necessary technical data of the site for the implementation of the project. The United Nations in response to a request from the Govt of Nepal, made an engagement with Kenzo Tange and Urtec for phase II of the Master Plan for the development of Lumbini in 1975.

With the completion of Master Plan in 1978, the development of Lumbini was started after the final approval by the His Majesty's Government/ Nepal (HMG/N) and the UN. The International Committee for the development of Lumbini, New York, USA and Lumbini Development Committee (LDC) Nepal were actively involved during the initial development stage. UNDP contributed US\$ 747,000 for preparation of the Master Plan. Expo Japan donated US\$ 40,000 for soil testing and other allied works. The Government of Nepal invested US\$ 100,000 for the survey and preparation of maps.

In the first phase, a 3x1 square mile plot of land equal to about 774 hectares was acquired by evacuation of seven villages and a local market. The affected people were given adequate compensation and provided with other facilities. Soon afterwards, the afforestation program was started to give Lumbini a natural setting. Around 620,000 saplings of different varieties were planted to make the complex green with lush sal and other trees.

In this stage, the emphasis was made toward formulation of development programmes on the basis of development priorities and phasing, complying with the following criteria:

1. Conservation and maintenance of the archaeological site and findings.
2. Protection of the archaeological site against flood.
3. Indispensable and minimum facilities & infrastructures for the function of the Lumbini Garden.



4. Enhancement of the tourist attraction.
5. Appropriate share of the immediate investment in the total investment.
6. Compatible introduction of private investment with the Lumbini Garden.
7. The priorities and phasing required by the Lumbini Development Committee.

Based on the development priorities of the above, all the works were proposed for completion in three phases as given below.

First Phase (up to 1980)

First Phase functions as the immediate development action up to 1980, with high priority given to the Lumbini Center Link, Sacred Garden, Monastic Area and relevant infrastructures.

LUMBINI CENTER	
* Tourist Information Center	100%
* Administration Center	50%
* Tourist Accommodation	50%
* Pilgrim Accommodation	65%
* Medical Center	35%
* High School	100%
* Retail & Service Facilities	35%
CULTURAL CENTER	
* Museum	35%
* Auditorium	100%
CENTRAL LINK	
* Central Canal	100%
* Pedestrian Space	65%
* Service Facilities	50%
SACRED GARDEN	
* Circular shaped levee link	100%
* Major Pedestrian path	100%
* Protection banking of Sacred Area	100%
MONASTIC AREA	
* West Monastic Plaza	100%
* East Monastic Plaza	100%
* Main Access with branch canal	100%
* West Monastic Lots	30%
* East Monastic Lots	30%

INFRASTRUCTURES	
* Bhairahawa-Lumbini Road	100%
* Peripheral road	100%
* Major service roads	100%
* West Monastic Lots	30%
* Utilities	

Fig. 22. Implementation of Master Plan up to 1980

Second Phase (1980-1985)

The Second Phase includes all later development works: this includes the 80% of the Monastic Area as an independent development. The development of the Sacred Garden was depending on the progress of the archaeological excavations.



Third Phase (After 1985)

- Extension in Lumbini Center and Cultural Center;
- Completion Monastic Areas and Sacred Garden;
- Planting in the Entire Site;

According to the priorities and phasing as mentioned in the Master Plan, it was scheduled by the major construction works would be completed by the year 1985. The total cost estimate was US\$55 million

The First Phase was expected to be completed by 1985 at a cost US\$ 17 million. In 1983, the HMG/Nepal had incurred an expenditure of US\$ 7 million; in addition to more than US\$ 4 million set aside for the completion of the remaining Infrastructure works. However, only 10% of the total work was completed:

	COMPONENTS	COST (US\$ Million)
1	Landscaping & site works	16.7
2	Infrastructure & Utilities Networks	7.4
3	Lumbini Center buildings	17.3
4	Museum, Auditorium, Library & Research Institution	12.0
5	Pilgrim and Middle Class Accommodation, High School etc	1.6
	TOTAL	55.0

Fig. 23. Cost estimate as proposed in 1978-1985

- Siddharthanagar Airport
- Approach road to Lumbini from Bhairahawa
- Archaeological Excavations and Restorations
- Partial Completion of Periphery Road
- Completion of Basic Works on Infrastructure-Road, Electricity, Telecommunication, Sewage
- Library (Reiyukai, Japan) - completed in 1989
- Museum (Government of India) – completed in 1989
- Pilgrim Accommodation (low class tourists- Govt. of Sri Lanka) – completed in 1986

Because of a lack of resources due to the reduced interests of the international donor organizations, and the poor management of the development of Lumbini. Major building construction and landscaping works remain to be done. Hence, the Master Plan was not fully realized and the delay in project execution has resulted in a huge cost overrun, which will impede achievement of its goals in the future.

4.2. Implementation Period, 1986-2000

In 1986, a revision of the construction program was proposed and prepared by the LDT. This revision recommended the construction of the development works of the Master Plan to be completed within 1991/92 at the cost of US\$ 55.197 million. During the years 1989-1991, there was not much progress in development works of Lumbini due to changing political situation in Nepal. By 1995, only 10% of the work was finished and there was no Planning proposal for completion of the remaining works.

In 1995, the LDT appointed a national technical team to review the development work in Lumbini and submitted a report to suggest speedy progress. The team made the recommendation that there were components in the Master plan which, if modified, would be more appropriate. According to their suggestion, many components of the Master Plan should be revised and simplified without disturbing the basic essence of the Master Plan:



1. As per the Master Plan, the buildings in Lumbini and Cultural Center should be of Monumental character. Buildings built in monumental character in the Cultural Center justify their functions and they cost almost three times the conventional type of building. However, buildings in the Lumbini Center are more functional in type, like the information Center, Curio Shops, Restaurants etc. The technical team suggested that a conventional character of the Lumbini Center would reduce the costs considerably. There by, the small realistic packages of the remaining buildings in the Lumbini Center could be prepared to attract small donors, instead of waiting for huge funding agencies.
2. As per the Master Plan, the Central Link is a very important component and its cost estimate is very high at US\$ 2.50 million. It is necessary to implement works Phase wise and allocate budget accordingly, along with revision of the design components and cost estimate of the Central Link.
3. As per the Master Plan, the cost estimate of the infrastructure works is US\$ 11.6 million. The cost reduction is necessary through proper phasing and simplification of design for proper implementation of these essential services.
4. As per Master Plan the total estimated cost of the Landscaping in the East and West Monastic Enclaves is US\$ 5.65 million. If completed at the estimated cost the annual cost of maintenance will far exceed the annual rent from the land of the monasteries. Hence, the design should be modified to reduce both construction and maintenance costs.

Based on the above study, it was recommended that the Master Plan should be revised for early implementation of the works. For this, a Task Force of technical personnel was formed to facilitate a further detailed study. The Task force consisted of three technical personnel from among those who already had enough knowledge about Lumbini Development Project. The terms of Reference for this Task Force were as follows:

1. Review the Master Plan
2. Identification of the components which cannot be implemented within the budget of LDT and donors and proposal of solutions for the said components.
3. Preparation of practical requirements of the project
4. Construction of revenue generating projects
5. Work Program of archaeological excavation and restoration
6. Preparation of detailed bylaws for Monastic enclave
7. Short and long term programme for development of surrounding Buddhist Areas of Lumbini

The team included the Cost Estimate of Land Development Works of the Various Components, as Estimated Cost in 1981 and then in the present stage, 1999, the year when the team prepared the Analysis Report. It is clearly evident that the present cost has increased by about 4.2 to 4.5 times.

According to the table, the total cost estimate arrived was US\$ 20.711 million in 1999, which was far higher than the annual budget of Lumbini Development Trust Office. This was only US\$ 0.15 million and more than 80% of it was spent on regular administrative expenses. The team made the recommendation that works should be categorized in order of their urgency and priority:

	COMPONENTS	1980(million US\$)	1999(million US\$)
1	Central Link	1.613	1.985
2	Roads		
a	Metalled Roads	2.8	3.42
b	Service Roads	0.701	0.86



3	Landscaping		
a	Lumbini Center & Cultural Center	1.006	1.236
b	Monastic Zones East & West	3.400	4.176
c	Sacred Garden	1.613	1.983
4	Flood Control	0.426	0.524
5	Water Supply	1.000	1.229
6	Sewerage Disposal	1.200	1.475
7	Electric Power Supply	2.406	2.950
8	Telephone System	0.710	0.873
	TOTAL	16.875	20.711

Fig. 24. land development works of Lumbini Development Project

1. Protection Works: this covers flood protection work around Sacred Garden area, such as construction of circular levee around sacred garden lowering of the water table by constructing a sacred tank and improvement of the cross section and level of Telar River. The other protection works required for the Monastic Zones also come under this priority along with surface drainage works of the whole Master Plan area.
2. Essential Services: this includes the provision of water supply and a sewerage system in the project area as the first priority. Another measure is the temporary supply of electrical services through overhead wires and a phase wise execution of the Road Works. Both the Central Link in the Lumbini Center and buildings in the Lumbini Center should be completed to realize the master Plan on site. The construction of building in the Lumbini Center should be done in different manner to reduce the cost.
3. Landscaping: the landscape protection works such as the retaining wall for the sacred tank, gate structures and the improvement of River Telar should be the first priority. The Landscape works of the Central Link, Cultural Center and Lumbini Center should be the Second priority, followed by the beautification works of the Monastic enclave. According to the study, the LDT does not have adequate funds for the implementation of the remaining components, while on the other hand the estimated costs are too high as they are made with assumption that funds will not be a problem. In the present situation, financial mobilization has been the greatest problem. It is necessary to realize that the design should be simplified and the cost estimate should be revised so that project is more cost effective and within the capacity of LDT.

Accordingly, the methods of the Construction Programme and Work Schedule should be revised. The methods of Minimum and Maximum Programme should be fixed first and they should be implemented in phases. The first phase of the Minimum Programme should consist of parts of the components essential for the activities as per the Master Plan. The second phase of the Minimum Programme is, therefore, the extension work of this portion of the essential components of the land development, which have been executed in the first phase. The Maximum Programme should comprise of beautification works, which are usually costly and not essential for daily activities of the major areas of the Master Plan.

The team recommended that the LDT make a programme to implement the First Phase of the Minimum programme through its own annual budget and shall complete within a fixed target



year of 5 to 15 years, as per expected fund mobilization. The remaining works- Second Phase of the Minimum Programme and all the works in the Maximum Programme would be implemented through donations from different Buddhist organizations and friendly countries. The team strongly recommended that works that are not as per the original master plan, should not be entertained even if donations are made. However, the proposal was documented only and there was no real progress made on the site as per the recommendation.

In 1998, the world Buddhist Summit held in Lumbini also addressed the issue and suggested that the existing Master Plan should be reviewed in consultation with the international community and others concerned, in order to complete the works as soon as possible. Accordingly, a task force team was formed by UNDP to propose the terms of reference for the review mission, which would review the master Plan prepared by prof. Kenzo Tange under the leadership of Dr. Ananda W.P.Guruge in 1999.

Many distinguished national and international experts prepared review papers on different aspects of the Master Plan. According to the report prepared by the architect/planner Shankar M.Pradhan (Pradhan 1999), much remains to be done to implement the Master Plan. The identified unfinished items include 19 components, half of which are infrastructural, and the rest include structural works.

The study recommended prioritization and phasing of the development activities for the implementation period 2001-2010. According to the recommendations, the remaining 19 project components should be categorized as priority I (1, 2 and 3 year projects), Priority II (4, 5 and 6 year Projects), Priority III (7, 8 and 9 year projects) and priority IV (subsequent year projects).

The report emphasized that priority should be given to make than functional in order to motivate further development activities. Another priority should be to focus on the follow-up of the archaeological work, according to the criteria of the world Heritage Convention. LDT considered this an appreciable work by UNDP for the development of Lumbini. Yet there was no improvement of work progress on the site, despite all the proposal and evaluations being made for its development.

	PROJECT	PRIORITY I	PRIORITY II	PRIORITY III	PRIORITY IV
A	INFRASTRUCTURE				
1	Roads	•			
2	Pedestrian Path		•		
3	Water Supply Main Layout	•			
4	Pumping Station	•			
5	Overhead Tank	•			
6	Drainage Main Channel	•			
7	Sewerage	•			
8	Street Lighting	•			
9	Lumbini Center				
i	Block 1 & 2	•			
ii	Block 3 & 4		•		
iii	Block 5 & 6			•	
iv	Block 7 & 8				•



10	High School Complex		•		
11	Hospital		•		
12	Camping Ground 1			•	
13	Camping Ground 2				•
14	Pedestrian Path		•	•	•
15	Boat Station	•	•	•	•
16	Lumbini Square			•	•
17	Visitors' Facilities			•	•
18	Symbolic Pavilion				•
19	Archaeological Office	•			

Fig. 25. Prioritization and Phasing of the development activities for the Implementation Period of 2001-2010

During 1985-2000, the following components of the Lumbini Development Project were completed:

- High Class Accommodation (Hokke Hotel, Japan), Completed in 1990
- Lumbini International Research Institute (Reiyukai, Japan), Completed in 1996
- Accommodation for Research Scholars (Reiyukai, Japan), Completed in 1998
- Peace Pagoda, Nipponzan Myohoji (Fuji Guruji), Completed in 1999
- Panditaram Meditation Center, Mynmar, Completed in 1995
- Crane Sanctuary in Lumbini Center
- Monasteries, Completed in this phase:
 - Government of Myanmar
 - Mahabodhi Society, Calcutta
 - International Nun Centre, Nepal
 - Buddhist Association of China, China
 - Tara Foundation Duesseldorf, Germany
 - Drigung Kagyud Meditation Center, Ladakh

The Lumbini Development Trust submitted the cost estimates to HMGN- National Planning commission for inclusion in the Ninth Plan in February 1997, when the conversion rate was US\$ 1.00=NRs.57.00. The total cost for the five year phase was US\$ 56.8 million, of which 92.6% was allocated for Lumbini Garden. The priority activities proposed by LDT for the Ninth Plan have a regional perspective.

The Proposed Activities for Lumbini Garden include 14 components, half of which are infrastructural (road, water, sewerage, drainage, electricity, telecommunication and fencing). Structural works include the Lumbini Center, the central plaza, the footbridge, landscaping, the symbolic pavilion, the U Thant auditorium and the archaeological office. The seven sites of Kapilvastu district have 9 project components. These are also mostly infrastructural works including land acquisition. Archaeological excavation and conservation is a minor component.

Given the socio-economic conditions of Nepal, it is clear that Nepal's Ninth Plan will not be able to provide LDT's expectation of US\$ 56.8 million for the priority projects. Unless outside donors respond with financial support, the proposed projects will remain mere aspirations, as in the past. According to Dr.Harka Gurung (Gurung 1998) the fulfillment of this plan should consider some practical measures:



	Site (District)	US\$(million)
1	Lumbini Garden (Rupandehi)	52.6
2	Devedaha (Rupandehi)	0.6
3	Ramagram (Nawal-Parasi)	0.3
4	Araurakot, Tilaurakot, Gotihawa, Kudan, Niglihawa, Sagarhawa, Sisaniya	3.3
	Total	56.8
	PROJECT COMPONENTS	US\$ 1000
1	Road	
a.	Service Road	1249
b.	Metalled Road (Internal)	4975
c.	Ring Road (Periphery 8 mile)	7819
2	Water Supply System with tower and reservoir	
3	Sewage System	987
4	Sacred Garden (Access Road and drainage system)	2065
5	Electrical Power System	2885
6	Telecommunication System	4360
7	Lumbini village (8 blocks)	1160
8	Camping Grounds, Central Plaza, related structures	12725
9	Colonnade, foot bridge, bridge between Lumbini Centre	105
	Landscaping of Monastic Zone (canal pond, road & path)	1598
10	Lumbini Village (N&S ponds, canal and path)	7887
11	Symbolic Pavilion (Type 1)	
12	Auditorium (U Thant World Peace)	1487
13	Archaeological Office	2905
14	Fencing Works, 8ft.height in periphery (8mile)	126
		225
	Total	52558

Fig. 26 & 27 Cost estimate for (1997-2002) (Source : Lumbini Development Trust. Feb. 1997)

1. Review the Master Plan and modify if necessary;
2. Division of development activities into three phases: Short term (immediate) targeted for 2000; Medium term (intermediate) for 2000-2005; long term (ultimate) to fully realize the Master Plan.

According to Dr. Gurung, the project is able to slowly gaining momentum despite the fact that the progress of works is slow. It is worthwhile to mention that some of the prominent building structures have been completed. Thus, the management should start taking initiative to mobilize them for further development activities. Another priority is the follow up of the archaeological works according to the criteria developed by the world Heritage Convention. Dr.Gurung emphasized that there are two preconditions to realize the development of Lumbini as planned. The first concerns commitment and the second cooperation. There is need for a strong commitment on the part of the host government to develop Lumbini. This includes both the financial resources and the need

for making LDT as an autonomous institution. The frequent change in LDT management since 1992 has greatly hampered the functioning of this institution. The mission of LDT is of international dimension and its management must have continuity to enable wider contacts. The second precondition is to mobilize wider cooperation, which refers to the need for reviving the UN bases International Committee for the Development of Lumbini.

	Description	Estimated Cost (US dollar)	Estimated Cost (Nepali Rupees)
1	Pond, Sewerage, Road & Archaeological building works inside Sacred Graden	4,885,000/-	3,60,767,250/-
2	River Training	7,64,000/-	56,421,400/-
3	3.a. Gravel Roads	1,24,9000/-	92,238,650/-
	3.b. Black metalled Roads	4,975,000/-	367,403,750/-
4	Camping Ground Central Plaza & other works	105,000/-	7,754,250/-
5	Collonade & Foot Bridge	1,598,000/-	11,80,12,300/-
6	New Lumbini Square North	6,184,000/-	456,688,400/-
7	New Lumbini Square South	6,541,000/-	483,052,850/-
8	Lumbini Center-North & South Pond & Lands caping works in Canal	1,802,000/-	133,077,700/-
9	Symbolic Pavilion Type 1	497,000/-	36,703,450/-
	Symbolic Pavilion Type 2	99,000/-	7,311,150/-
10	Archaeological Building	126,000/-	9,305,100/-
11	Central Canal	288,800/-	213,278,800/-
12	High School	894,000/-	66,021,900/-
13	Telecommunication Center	1,160,000/-	85,666,000/-
14	Electricity Supply	4,360,000/-	321,986,000/-
15	Water Tank & Reservoir	471,000/-	34,783,350/-
16	Water Supply System	516,000/-	38,106,600/-
17	Sewerage System	2,065,000/-	152,500,250/-
18	U Thant Building	2,905,000/-	214,534,250/-
19	Boundary Wall	1,125,253/89	83,099,999/77
	Total	48,695,053/89	3,788,080,649/77

Fig. 28. Remaining works and their cost estimate (Source : Lumbini Development Trust)

4.3. Implementation period, 2000 onwards

LDT achieving steady progress in the implementation of the Master Plan. However the tasks that remain are immense and larger resources are needed. The LDT needs both technical and financial empowerment to work towards the full realization of the Master Plan. The current objective is focussed on completing the works in the Sacred Garden and on river training works within the target of 25 years following is the list of works, completed and pending of the components of the Master Plan.

Completed works

Restoration of Mayadevi temple - Completed: 2003



- Link Road- Friendship Bridge
- Metalled road
- Pending works
- Middle-class accomodation (Mikasa Hotel, Japan)
- Nepal Vipassana Meditation Centre, Nepal
- High School complex
- Central canal with 3 boat station
- River diversion and levee embankment at Harhawa River
- Service roads
- Sacred Garden- Access roads and drainage systems
- Boundary wall to the east periphery road
- Works not yet started
- Electrical power supply system
- Telecommunication system
- Water Tower & Reservoir
- Water Supply System
- Sewerage System
- The U Thant World Peace
- Camping Grounds
- Central Plazas and Related Structures
- Colonnade and Foot Bridges
- Lumbini Squares 1 & 2
- Landscaping works – Monastic Zones & Lumbini Center
- Symbolic Pavilion Type 1 & 2
- Archaeological Office
- Elimination of Structures inside the Lumbini Garden

Based on the progress of the implementation of the Master Plan, the LDT has made a revised cost estimate for the remaining works and has prioritized the works within the context of their Current objective. It is hoped that with increasing financial support from the government in the recent years, the progress will be faster than realized in the past. Despite the financial and management issues since the early implementation phase over the 30 years, the Master Plan is slowly getting into shape and the works so far completed have been able to generate the interest, locally and globally.

	PROGRAMS	Estimated Cost
1	Pond, Drainage, Roads & Archaeological Building works, Gridding inside the Sacred Garden	360,757,250/-
2	River Works	56,421,400/-
3	Boundary Wall approx. 11.4 km	83,099,999/77
4	Central Canal	213,278,800/-

The LDT is geared towards initiation of other activities to fulfill the Master Plan within the target period:

- Increase Participation of international assistance for development of Lumbini;
- Establish a world Buddhist University;
- Programs for World Buddhist Summit;
- Importance of International Airport at Lumbini;
- Revision of Lumbini Development Trust Act;



Fortunately, the LDT has been able to gain support and cooperation from wider sectors, local and international, to achieve its objectives. International organisations such as United Nations Development Programme (UNDP), United Nations Educational Scientific and Cultural Organization (UNESCO), Japanese Buddhist Federation (JBF), world Fellowship of Buddhists (WFB), Asian Development Bank (ADB), Embassies and NGOs have been actively involved from as early as the 1960s. Meanwhile local organization have also shown their concern and contributed towards the development of Lumbini. According to LDT, following agencies have been involved:

- ADB is providing financial assistance of 3.4 million US dollar for the completion by 2009 of central link, access roads, pedestrian paths, water supply and distribution system, parking, chain link fencing;
- JBIC has proposed to provide financial assistance for the following works: infrastructure improvement works for Sunauli Border, construction and improvement of Bhairahawa-Lumbini roads, construction and rehabilitation works of roads linking Lumbini to other related significant places of Buddha, well equipped parking places, public awareness and income generating training programs in surrounding villages;
- UNDP, DFID and SNV/Nepal provide financial assistance for Awareness training, skills training, roads, small electrical programs in 7,000 houses in surrounding villages (Aama, Bhagwanpur, Lumbini Adarsha, Tenuhawa, Ekla, Khudabagar, Madhubani);
- The Government of Thailand has proposed financial assistance for the completion of the Lumbini Master Plan.

5. CONCLUSIONS: CURRENT ISSUES AND CHALLENGES

Though the Lumbini Development Project was started almost 30 years ago, the increasing delays in the implementation of the Master Plan have created more problems than originally visualized and much there remains to be done despite the significant achievements made.

The major infrastructure works have not started due to lack of adequate technical and financial support, giving rise to unsequential development processes. Also, there is an urgent need for maintenance units to be established in order to ensure the regular repair and maintenance of the completed works.

The Development of the Sacred Garden Progresses Steadily with priority being given to landscaping protection works, afforestation and exposition of the archaeological remains. The relocation of Mahendra Pillar and the dismantling of other structures in the vicinity of the site are planned within 10-20 years.

For the Lumbini Cultural Center not a lot of elements have been implemented. Besides the building, Major infrastructural works such as roads, central canal and its subsidiary elements to be done. These are of monument character, which causes higher costs and the delays are mainly linked to the lack of adequate financial resources.

The constructions in the Monastic Zone have achieved some architectural identity of their own, but have failed to adhere to the desired population density as mentioned in the Master Plan. The landscaping and site development works are lagging far behind in comparison to the increased construction activities in the Monastic Zone. This has resulted in unsequential development where magnificent monasteries are built without proper provision of basic infrastructure and services.

All associated structures and landscaping works are still to be carried out. Open spaces, plazas and water bodies need to be planted with appropriate trees and vegetation. Therefore, at



present, there is no continuity in physical structures and landscape elements from Lumbini Center to Sacred Garden as Proposed in the Master Plan.

The International Committee for the Development of Lumbini, which has played a significant role in international fund raising activities in the 1970 and 1980, has been ineffective in the past decade, thus aggravating the resource crisis. At the same time, the grant provided by the government does not fulfill LDT's requirements. To implement the Master Plan the LDT needs bigger financial resources to meet the requirement of the project, which go beyond the socio-economic capacity of the country.

By the present way of implementing the Master Plan, problems arise from haphazard development works along the peripheral road outside the Project Area. The construction of market centers, hotels, temples, mosques, churches, small industries, residential complexes and other recent additions in the surrounding are threatening the spiritual and historical values of the site. The LDT has not been able to deal with issues regarding the zoning and pattern of ownership of the surrounding areas. Therefore, a mechanism should be established to facilitate the relation between LDT and local VDCs. The issues in the surrounding territory.

Therefore, LDT should now realize its greater role in monitoring the development activities as per the Master Plan. It is now time to realize that the project should be based on sustainable economy, through mobilization of available resource and technology. It requires timely intervention of appropriate technical, social and economic analysis for the sustainable development of the project. Its implementation plan should be formulated with the consideration of a financing modality and modern institutional setup to operate and manage the cultural entity within the context of the country.

Additionally, there should be a definite and clear vision for the development of Lumbini. The LDT management should have strong leadership and a clear management structure to co-ordinate the works and allocate the resources. Appropriate models for local development programs, with an integrated approach to meet all concerns should be proposed. These programs should address the existing socio-economic factors and involve community participation. Similarly, proposals for international campaigns and mobilization of international ambassadors should be worked on. The Master Plan should be implemented in a realistic manner, through prioritization or phase-wise implementation of the works, whereby the development activities should be monitored by HMDN-Department of Archaeology, Ministries and UNESCO.

Finally, the current challenges require judicious planning for timely and proper implementation of the works, through identification and evaluation of certain related issues:

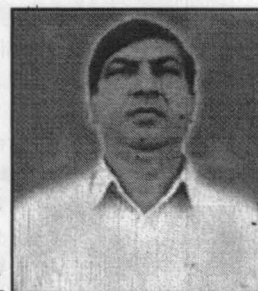
- Co-ordination of administration and management levels;
- Legal empowerment of LDT;
- Formulation of financial modality for successful completion of the Master Plan;
- Technical support along with financial assistance;
- Co-ordination among national and international organizations.

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Lumbini: Sacred Value and Environmental Challenges

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I. Introduction

Lumbinî, the birthplace of Lord Buddha, is situated about 22 km. from Bhairahawâ (Siddharthanagar), below the Churiâ range, on the western bank of Telâr River in Rupândehi district of Lumbinî zone in Nepâl. It is about 100 MSL. Buddha, known as the Lord of Asia, was born in Lumbinî during the fullmoon day in the month of Vaiûâkha in 563 BC. He was born under an Asoka or sal (*Shorea robusta*) tree when Mâyâdev? was going to her maternal town Devadaha on the occasion of delivery.

The location of Lumbinî is pointed out in the Buddhist literature, as well as, in the records of the Chinese pilgrims who visited here in the fifth and seventh centuries AD. As mentioned in Jâtaka story this sâl garden was in joint possession of the Úâkyas and Koliyas during the life time of Buddha. The Mahâvamsa, a Ceylonese chronicle, and Nidâna kathâ have also located it between Kapilvastu and Devadaha. During the reign of the Úâkyas of Kapilvastu and the Koliyas, Lumbinî was a small dwelling site from where the visitors of two states use to walk through there. The sâl garden was the place of recreation during the reign of the Úâkayas and Koliyas. Buddha charita of Aœvaghosa describes Lumbinî as "gay like the garden of caitra ratha with trees of every kind.

It was linked through the popular 'Uttara path' to Kapilvastu, Râmagrâma and other important cities during the Buddhist period.

All of the external factors affecting an organism belong to Environment. These factors may be other living organisms (biotic factors) or non-living variables (abiotic factors). These are temperature, rainfall, day length, wind, and ocean currents. The interactions of organisms with biotic and abiotic factors form an ecosystem. Even minute changes in any one factor in an ecosystem can influence whether or not a particular plant or animal species will be successful in its environment. Organisms and their environment constantly interact and both are changed by this interaction. Like all other living creatures, humans have clearly changed their environment, but they have done so generally on a grander scale than have all other species. Some of these human-induced changes—such as the destruction of the world's tropical rain forests to create farms or grazing land for cattle have led to altered climate patterns. In turn, altered climate patterns have changed the life way of animals and plants are distributed in different ecosystems. Pollution is an undesirable change in the physical, chemical or biological features of air, land, sound and water. It will harmfully affect human life or other species, living conditions, cultural assets and deteriorate resources of raw material. Pollution interfere human health, the quality of life, or the natural functioning of ecosystems. Although some environmental pollution is a result of natural causes such as volcanic eruptions, most is caused by human activities. Deterioration of the environment effects in the conservation and preservation of the ancient monumental structures as well as artifacts. Pollution controlling is the main challenge to the human beings in the twenty one century. Lumbini is also going to be polluted day by day due to careless of the authorities and civil society. Unmanaged industries and population growth are also creating environmental problems



day by day.

II. Environmental Position

The present location of Lumbinī, the exact birthplace of Lord Buddha, is absolutely clear in the western Terai region of Nepāl. The narrow ridge of the Churiâ range runs parallel to the Mahâbhârat Mountain range from east to west. Almost the Neocene rocks in Nepāl are the molasses deposits of the Siwâlika group, which forms the Churiâ hills. This belt shows a few scattered houses made of wooden pillars and dry-grass as a protection-tower against wild animals. Sandy soil with boulders of the region is not so fertile for regular cultivation. On the south of the Siwâlika range the Indo-Gaṅgetic plain named the Terai is distributed with an elevation lower than two hundred meters MSL from Nârâyaôî to Râpti River in the region. The Terai is composed of gravels and sands and of the late Pleistocene to Holocene age. The great river system, viz., Rohiôî, Kôphî, Tinâu, Dano, Koilihawa, Telâr, Bâðagaṅgâ and their tributaries form the fertile and sandy alluvial soil in the region. In course of his pilgrimage Hiuen-Tsiang has pointed out that, the soil of the region was fertile and farming operations were regular in suitable weather.

In this region thick forest contains *Shorea robusta* (sal, sakhuwa) *pinus longifolia* (chir), elephant grass, *acacia catechu* (khair), *Salmalia mala boica* (simal), *Dal bergia Sissa* (Sisau), *Zyiphus Jujuba* (Bair) even now, especially in the northern belt from east to west in the region. In the sixth century BC plaksha tree (*Ficus lacor*), mango tree (*Mangifera indica*), pipal tree (*Ficus religiosa*), sal tree (*Shorea robusta*) and *Aœoka* tree (*Saraca indico*) were associated with the indigenous trees of the area. According to Bhadda-Sala Jataka there were trees in the park for making columns of the palace; but transportation was impossible due to rough road. This evidence reveals that natural forests as well as parks had been developed in the Buddhists period. Mahavana and Lumbinîvana were associated with this region.

This region has hot and humid climate. Lumbinī (elevation 100 m) has a tropical monsoon climate characterized by a cold season, hot season, monsoon and transitional periods. The core of the cold season extends from the beginning of December to the end of January with temperature occasionally dropping to +60c. Rainfall is minimal and relative humidity may reach 89%. There tends to be a spell of 7-10 days of foggy weather in December and another such spell in January otherwise sunshine prevails. The hot season lasts from the beginning of March until June. During the peak of the hot season (May), temperatures may rise to +390c with a low relative humidity and minimal rain fall. Some times strong winds blow across Lumbinī. Department of Meteorology cites June 12 to September 23 as the period of the annual monsoon in Nepāl. The highest rainfall (approximately 300 mm.) is recorded in July and August. The maximum temperature in June (Approximate +370c) gradually comes down to slightly above +300c doing July, August and September. Minimum Temperature was 80c and maximum 400c in January and May 2004 respectively. The monsoon remains active between June and September. Being alluvial and fertile area, it is known as the granary of the western Nepāl. The rivers flow southwards and meet Gaṅges in India forming wide beds. The rivers related with Himâlayan, Mahâbhârata and Churiâ ranges, were responsible for the formation of the Terai region. The level of the plain land rose due to the sedimentation of Indo-Gaṅgetic through forming new river channels in this area for the drainage. Rivers flow from the north to the south slope in this area. The Tinâu, Dâno, Tilâr, Bâðagaṅgâ (Bhâgirathi) and Kôphî have their origin in the Himâlayan and northern hills. The position of the Rohiôî, Tilâr, Bâðagaṅgâ (Bhâgirathi) and Anomâ is more precisely indicated by the Chinese pilgrims and Ceylonese chronicle.

According to the Master Plan with a total area of 25 sq miles, only 3 sq mile is main core area of the sacred complex of Lumbinī. Archaeological Garden, Monastic Zone and New Lumbini Village are it's main area. One sq mile in each sector on south to north is separated as restricted area. After the restricted area one sq. mile on east, one sq. mile on west and two sq mile on south

is planned Agriculture Zone (Buffer zone.) The east and west monastic zones set a side for the two major sects of Buddhism. Theravada (Hinayân) and Mahâyan have witnessed a number of developments by friendly states and institutions. These stûpa, vihâr and monasteries have been developing the Lumbinî as "A Mini World of Buddhism". Each of them has constructed their building own their national architectural design, tradition, techniques and religious trends. Elements of the Master Plan are incomplete. Because of incompleteness of internal brick pavement, canal, cross-bridge and boundary wall air and water is polluted. Deforestation, drainage system, dustbins, pure drinking water, under ground water system, cement-work in the Master Plan-area, smoky vehicles, old buses, truck and micro-buses are the burning problems of Lumbini complex. Unexpected population growth, rapidly construction of the concrete blocks in buffer-zone, lack of public awareness, participant to keep neat and clean are also main causes of pollution.

III. Factors Threatening the Environment

The problems facing the environment are vast and diverse. Global warming, the depletion of the ozone layer in the atmosphere and destruction of the world's rain forests are just some of the problems. Many scientists believe that it will reach critical proportions in the coming decades. All most all of these problems will be directly affected by the size of the human population. It's main factors are as follows-

A. Population Growth

Human population growth is at the root of virtually all of the world's environmental problems. Although the growth rate of the world's population has slowed slightly since the 1990s, the world's population increases by about 77 million human beings each year. As the number of people increases, crowding generates pollution, destroys more habitats and uses up additional natural resources. The Population Division of the United Nations (UN) predicts that the world's population will increase from 6.23 billion people in 2000 to 9.3 billion people in 2050. The UN estimates that the population will stabilize at more than 11 billion in 2200. Other experts predict that numbers will continue to rise into the foreseeable future, to as many as 19 billion people by the year 2200.

Although rates of population increase are now much slower in the developed world than in the developing world. It would be a mistake to assume that population growth is primarily a problem of developing countries. In fact, because larger amounts of resources per person are used in developed nations, each individual from the developed world has a much greater environmental impact than does a person from a developing country. Conservation strategies that would not significantly alter lifestyles but that would greatly lessen environmental impact are essential in the developed world.

In the developing world, meanwhile, the most important factors necessary to lower population growth rates are democracy and social justice. Studies show that population growth rates have fallen in developing areas where several social conditions exist. In these areas, literacy rates have increased and women receive economic status equal to that of men, enabling women to hold jobs and own property. In addition, birth control information in these areas is more widely available and women are free to make their own reproductive decisions. Around the sacred complex of Lumbini the rate of population growth is high due to the settlement of the Muslims. They do not like family planning. On the other hand landless people have been settled down here by the government of Nepal. Their unmanaged social system and scattered settlement have also polluted the peace area of Lumbini. Factory workers and small merchants are living in the periphery of Lumbini. They are also creating uneasy atmosphere of the sacred site.

B. Global Warming

Like the glass panes in a greenhouse, certain gases in the Earth's atmosphere permit the

Sun's radiation to heat Earth. At the same time, these gases retard the escape into space of the infrared energy radiated back out by Earth. This process is referred to as the greenhouse effect. These gases, primarily carbon dioxide, methane, nitrous oxide, and water vapor, insulate Earth's surface, helping to maintain warm temperatures. Without these gases, Earth would be a frozen planet with an average temperature of about -18°C (about 0°F) instead of a comfortable 15°C (59°F). If the concentration of these gases rises, they trap more heat within the atmosphere, causing worldwide temperatures to rise.

Within the last century, the amount of carbon dioxide in the atmosphere has increased dramatically, largely because people burn vast amounts of fossil fuels, i.e., coal and petroleum and its derivatives. Average global temperature also has increased by about 0.6 Celsius degrees (1 Fahrenheit degree) within the past century. Atmospheric scientists have found that at least half of that temperature increase can be attributed to human activity. They predict that unless dramatic action is taken, global temperature will continue to rise by 1.4 to 5.8 Celsius degrees (2.5 to 10.4 Fahrenheit degrees) over the next century. Although such an increase may not seem like a great difference, during the last ice age the global temperature was only 2.2 Celsius degrees (4 Fahrenheit degrees) cooler than it is presently.

The consequences of such a modest increase in temperature may be devastating in Lumbini. Planted-trees in the area of Master Plan are removing and dying. Many plant and animal species will probably be driven into extinction, agriculture will be severely disrupted in near future. The frequency of severe hurricanes and droughts will be increased.

C. Depletion of the Ozone Layer

Ozone is a gas that blocks harmful ultraviolet sunlight. Industrial chemicals released into the atmosphere have caused ozone to break down, opening holes in the ozone layer that tend to concentrate at the poles. The ozone layer, a thin band in the stratosphere (layer of the upper atmosphere), serves to shield Earth from the Sun's harmful ultraviolet rays. In the 1970s, scientists discovered that chlorofluorocarbons (CFCs) chemicals used in refrigeration, air-conditioning systems, cleaning solvents, and aerosol sprays destroy the ozone layer. CFCs release chlorine into the atmosphere; chlorine, in turn, breaks down ozone molecules. Because chlorine is not affected by its interaction with ozone, each chlorine molecule has the ability to destroy a large amount of ozone for an extended period of time.

The consequences of continued depletion of the ozone layer would be dramatic. Increased ultraviolet radiation would lead to a growing number of skin cancers and cataracts and also reduce the ability of immune systems to respond to infection. Additionally, growth of the world's oceanic plankton, the base of most marine food chains, would decline. Plankton contains photosynthetic organisms that break down carbon dioxide. If plankton populations decline, it may lead to increased carbon dioxide levels in the atmosphere and thus to global warming. Recent studies suggest that global warming, in turn, may increase the amount of ozone destroyed. Even if the manufacture of CFCs is immediately banned, the chlorine already released into the atmosphere will continue to destroy the ozone layer for many decades. The hole the following year was slightly smaller, leading some to believe that the depletion of ozone had stabilized. Even if the most stringent prohibitions against CFCs are implemented. It is common problem of all the creatures. Due to the increasing rate of the industries, hot climate, land cultivation, deforestation, vehicles and population depletion of the ozone layer problem is also main cause of pollution of Lumbini area.

D. Habitat Destruction and Species Extinction

Due to soil erosion gully formation, a severe form of soil erosion, is a natural geologic process that can be greatly accelerated by human activities such as urbanization, deforestation, overgrazing of cattle and poor agricultural practices. Erosion attacks the moisture-bearing ability of soils and



adds deposits to waterways. These destructive processes continue at an increased rate on every continent, as over population and industrialization tax the remaining soil.

Among the human activities leading to this widespread deforestation are commercial logging, agriculture, mining, and oil exploration as well as small-scale subsistence activities, such as slash-and-burn agriculture, charcoal production, and firewood collection. Fire is used as the primary means to clear forests for agriculture and development, a dangerous method that frequently escapes control and destroys large areas of forest. Plant and animal species are dying out at an unprecedented rate. Estimates range that from 4,000 to as many as 50,000 species per year become extinct. The leading cause of extinction is habitat destruction, particularly of the world's richest ecosystems—tropical rain forests and coral reefs. If the world's rain forests continue to be cut down at the current rate, they may completely disappear by the year 2030. In addition, if the world's population continues to grow at its present rate and puts even more pressure on these habitats. They might well be destroyed sooner. Air, water, sound and soil pollution are the challenges due to the effect of natural devastating and human activities of Lumbini. Unmanaged industries have created pollution in the area of Lumbini complex. Industries should be established minimum 20 km away from the core area of the sacred complex of Lumbini and about 15 km far away from Siddharthanagar to Taulihawa road side.

IV. Types of Pollution

Pollution exists in many forms and affects many different aspects of Earth's environment. Point-source pollution comes from specific, localized, and identifiable sources, such as sewage pipelines or industrial smokestacks. Non-point-source pollution comes from dispersed or uncontained sources, such as contaminated water run off from urban areas or automobile emissions. The effects of these pollutants may be immediate or delayed. Primary effects of pollution occur immediately after contamination occurs, such as the death of marine plants and wildlife after an oil spill at sea. Secondary effects may be delayed or may persist in the environment into the future, perhaps going unnoticed for many years. DDT, a non-degradable compound, seldom poisons birds immediately, but gradually accumulates in their bodies. Birds with high concentrations of this pesticide lay thin-shelled eggs that fail to hatch deformed offspring. These secondary effects threatened the survival of species such as the bald eagle and peregrine falcon and aroused public concern over the hidden effects of non-degradable chemical compounds. Apart of the natural process human activities have been effecting the environment of Lumbini. Narrow mettaled-road, production of dust, running of heavy trucks, unmanaged industries and human activities are the main causes of pollution of Lumbini area. UNO, UNESCO, Nepal Government and civil society should be conscious to hand over pollution free Lumbini for future generation with out hesitation. One of them factories on the way side of Lumbini is the main created-problem at present. If we do not care in proper time and situation, it will create great problem in future. A lot of investment in factory is not easy to shift at another site in required time and situation. Owners and authorities should be careful to operate new industries on the road side from Siddharthanagar and Taulihawa, Lumbini UNESCO heritage site.

Table No.1
Factories in the area of Lumbini

SL. No.	Name of the Factory	Address	Established date	Distance from Lumbini	Distance from main Road	Production capacity	Materials
1.	Siddhartha Floor Mill	Gonahâ VDC- 6		13.3 km	25 meter, north		Floor

2.	Siddhartha oil Mill	Gonahâ VDC- 6		13 km	20 meter, north		Oil Mill
3.	Shyama Vinayala Ind.	Gonahâ VDC- 6		13.5 km	400 meter, north		Plastic
4.	Siddhartha Cement Ind.	Gonahâ VDC- 6		13.4 km	100 meter, north		Clinker-Cement
5.	Supreme Cement Ind.	Kamhariya-6	2059-12-24	13.4 km	300 meter, north	1,50,000 metric ton per year	Clinker-based Cement
6.	Kailash Cement Ind.	Kamhariya-6		13.4 km	400 meter, north		Clinker-based Cement
7.	Shyam Plywood Fac.	Kamhariya-6		13.4 km north	600 meter,		Plywood
8.	Ambhuja Cement Ind.	Kamhariya-6		13.4 km	650 meter, north		Clinker-based Cement
9.	Hira Brick Factory	Kamhariya-6		13.4 km	700 meter, north		Hira Brick Damodar
10.	Hira Cresar Ind.	Kamhariya-6		13.4 km	750 meter, north		Stone-pieces
11.	Jagadamba Cement Industry	Gonaha-7, Parsahawa	2058-1-28	13.3 km south	10 metre, metric ton	66,000 based per year	Clinker-Cement
12.	Brija Cement Industry	Gonaha-7, Parsahawa	2058-11-6	13.3 km south	20 meter, metric ton	60,000 based per year	Clinker-Cement
13.	Jagadamba synthetic Industry	Gonaha-7, Parsahawa	2059-3-24	13.2 km north	20 meter, metric ton	3,000 sacks per year	woven
14.	Buddha Paper and pulse Mills	Kamhariya-6	2058-7-3			18,000 metric ton per year	White-9000 and craft-9000 paper
15.	Triveni Distillery	Kamhariya	2053-6-13	9.8 km	300 meter, north	---kilo liter	wine 88
16.	Instant Mill Pvt.Ltd.	Kamhariya-	11.5 km		10 meter, south		
17.	Himalayan Noodles . P.Ltd	Kamhariya-6	11.3 km		100 meter, north		
18.	Wood Mill	Kamhariya-6	11.5 km		10 meter, south		
19.	Reliance Paper Mill Pvt.Ltd.	Kamhariya-6	10.5 km		350 meter, north		



20.	Reliance Cement Ind.	Kamhariya-	10.5 km		400 meter, north		
21.	Jagadamba Spining Mill	Kamhariya-	12 km		20 meter, north		
22.	Siddhartha Bricks and Tile Factory	Siddhartha nagar-8	19.4 km		400 meter, north		
23.	P.C. Brick Factory	Siddhartha nagar-8	20.5 km		300 meter, north		
24.	Varsa Engineering	Siddhartha nagar-8	21 km	20 meter,	north		

A. Air Pollution

Table No.1 shows that 24 factories have been established on the road site of Siddharthanagar and Lumbini. Almost all the factories are operating between 9 to 13 km area from Lumbini and not far from main road. Six cement factories are operating here. Two factories are going to operate in near future. Brown smog over phoenix, Arizona smog is caused by industrial and automobile pollution. It is compounded by temperature inversions, which cause the air pollution to be kept in a particular area for extended periods. Continued exposure to smog can result in respiratory problems, eye irritation and even death. Human contamination of Earth's atmosphere can take many forms and has existed since humans first began to use fire for agriculture, heating, and cooking. During the Industrial Revolution of the 18th and 19th centuries, however, air pollution became a major problem. Urban air pollution is commonly known as smog. Smog is generally a smoky mixture of carbon monoxide and organic compounds from incomplete combustion (burning) of fossil fuels such as coal, and sulfur dioxide from impurities in the fuels. As the smog ages and reacts with oxygen, organic and sulfuric acids condense as droplets, increasing the haze. Smog developed into a major health hazard by the 20th century. In 1948, 19 people died and thousands were sickened by smog in the small U.S. steel-mill town of Donora, Pennsylvania. In 1952, about 4,000 Londoners died of its effects.

A second type of smog, photochemical smog, began reducing air quality over large cities like Los Angeles in the 1930s. This smog is caused by combustion in car, truck, and airplane engines, which produce nitrogen oxides and release hydrocarbons from unburned fuels. Old and over smoky bus, jeep, truck and mini-bus are running on the way of Siddharthanagar, Lumbini and Taulihawa. Heavy and over loaded trucks are running to import and export raw and prepared materials of the factories. Sunlight causes the nitrogen oxides and hydrocarbons to combine and turn oxygen into ozone, a chemical agent that attacks rubber, injures plants, and irritates lungs. The hydrocarbons are oxidized into materials that condense and form a visible, pungent haze. This problem is seen in developed and developing countries. Vehicular and industrial emissions, street dust, thermal inversions and the city's location all contribute to the problem.

Eventually most pollutants are washed out of the air by rain, snow, fog, or mist. As pollutants build up in the atmosphere, sulfur and nitrogen oxides are converted into acids that mix with rain. This acid rain falls in lakes and on forests, where it can lead to the death of fish and plants, and damage entire ecosystems. Eventually the contaminated lakes and forests may become lifeless. Regions that are downwind of heavily industrialized areas, such as Europe and the eastern United States and Canada, are the hardest hit by acid rain. Acid rain can also affect human health and man-made objects; it is slowly dissolving historic stone statues and building facades in many countries.