LUMBINI, THE BIRTHPLACE OF THE LORD BUDDHA
WORLD HERITAGE PROPERTY
NEPAL
Ref. 666rev

ADDENDUM 2023

to
STATE OF CONSERVATION REPORT 2022

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1. World Heritage Committee Decision 44 COM 7B.148 (2021)

The World Heritage Committee,

1. Having examined Document WHC/21/44.COM/7B,
2. Recalling Decision 43 COM 7B.71, adopted at its 43rd session (Baku, 2019),
3. Notes the finalization of the Integrated Management Framework (IMF) for the property, but regrets that, despite multiple requests, the IMF has not been formally adopted by the State Party, and therefore reiterates its urgent request to the State Party to adopt and implement the IMF as a matter of priority;
4. Notes with concern that development activities continue to be undertaken within the property and its buffer zone prior to notification and submission of documentation to the World Heritage Centre, and also reiterates its request to the State Party to complete Heritage Impact Assessments (HIAs) for any proposed project, following the 2011 ICOMOS Guidelines on HIAs for Cultural World Heritage Properties, prior to carrying out any further work within the property or in adjacent areas identified as having potential archaeological significance, and to submit these HIAs and relevant project documentation to the World Heritage Centre for review by the Advisory Bodies, in conformity with Paragraph 172 of the Operational Guidelines, as soon as possible and before making any decisions that would be difficult to reverse;
5. Expresses its continuing concern about the Lumbini World Peace City initiative and its potential impacts on the property, the Buddhist Meditation Hall located within the Lumbini Kenzo Tange Master Plan Area, and the ongoing need for a clear strategy and concrete further actions to protect the Greater Lumbini Area and its wider setting, including but not limited to Tilaurakot and Ramagrama, and to reduce the increasing industrial activity in the vicinity of the property;
6. Takes note of different phases of the UNESCO/Japanese Funds-In-Trust project for the preservation of the property particularly progress made in archaeological research, capacity-building and awareness raising activities, together with an International Scientific Committee (ISC) established under the project, strongly encourages the State Party and other partners to take a holistic approach to focus efforts on the protection and management of the sacred site as a priority and to mitigate the potential or ascertained danger to the property’s Outstanding Universal Value (OUV) and the wider setting;
7. Requests the State Party to invite a joint World Heritage Centre/ICOMOS Reactive Monitoring mission to the property as requested in Decision 43 COM 7B.71 to assess its overall state of conservation, review the IMF and all ongoing studies and development proposals, and consider both the strategic approach to the Greater Lumbini Area, and the implications of the Lumbini World Peace City, in line with the protection of OUV of the property;
8. Also requests the State Party to submit to the World Heritage Centre, by 1 February 2022 an updated report on the state of conservation of the property and the implementation of the above, for examination by the World Heritage Committee at its 45th session.
2. Additional Information

This document is to be read in conjunction with the Lumbini, the Birthplace of the Lord Buddha SOC 2022 report (which is being resubmitted along with this document). The State Party of Nepal would like to highlight the progress made in the past years in addressing the issues raised by the World Heritage Committee.

2.1 Reactive Monitoring Mission

Decision: 44 COM 7B.148
Lumbini, the Birthplace of the Lord Buddha (Nepal) (C 666rev)

7. Requests the State Party to invite a joint World Heritage Centre/ICOMOS Reactive Monitoring mission to the property as requested in Decision 43 COM 7B.71 to assess its overall state of conservation, review the IMF and all ongoing studies and development proposals, and consider both the strategic approach to the Greater Lumbini Area, and the implications of the Lumbini World Peace City, in line with the protection of OUV of the property;

The joint World Heritage Centre/ICOMOS Reactive Monitoring Mission (RMM) to Lumbini was undertaken from 22 to 28 March 2022 to assess overall state of conservation, review the Integrated Management Framework (IMF) and all ongoing development projects.

The review the Reactive Monitoring Mission recommendations and the Integrated Management Framework action plan a meeting was organised on 22 November 2022 in Lumbini. The mission report has been received and has been carefully reviewed and discussed. We have understood the recommendations that were provided under Section 5.4 on pages 31-32 of the report.

The meeting was attended by Joint Secretary of the MoCTCA, Head of World Heritage Section of the DoA, Member Secretary, Project Chief, Senior Administrative Officer and Archaeological Officer from LDT, Kai Weise (World Heritage Management expert), Kosh Acharya (Archaeologist and Former DG DoA) and UNESCO.

2.2 Lumbini JFIT ISC Meetings

Decision: 44 COM 7B.148
Lumbini, the Birthplace of the Lord Buddha (Nepal) (C 666rev)
6. **Takes note** of different phases of the UESCO/Japanese Funds-In-Trust project for the preservation of the property particularly progress made in archaeological research, capacity-building and awareness raising activities, together with an International Scientific Committee (ISC) established under the project, **strongly encourages** the State Party and other partners to take a holistic approach to focus efforts on the protection and management of the sacred site as a priority and to mitigate the potential or ascertained danger to the property’s Outstanding Universal Value (OUV) and the wider setting;

A Lumbini JFIT ISC Meeting took place on 23rd and 24th March 2022. The ISC formulated recommendations in respect to Archaeology and Conservation, on Management, on Sustainable Development and Tourism and on Environment. These recommendations were reviewed before the Interdisciplinary Technical Meeting that took place on 22nd to 24th November 2022. The next Lumbini JFIT ISC Meeting is planned for the 27th to 29th March 2023.

The International Scientific Committee for the conservation and management of Lumbini (ISC) meeting in March 2022 strongly recommended to undertake practical actions for the conservation of the archaeological remains in Lumbini (with a view especially to water penetration inside the Mayadevi Temple), and welcomed the Lumbini Development Trust’s proposal to continue interdisciplinary research on how the archaeological remains inside the Mayadevi Temple can be better conserved. In this regard, an interdisciplinary technical meeting was organized on 23rd November 2022 in Lumbini jointly by LDT and UNESCO.

Immediate/short-term and mid-term/long-term actions to be undertaken were recommendations to support the long-term protection of the heritage within the shelter, in terms of both surface and subsurface remains.

### 2.3 Meeting on the Integrated Management Framework

**Decision: 44 COM 7B.148**

Lumbini, the Birthplace of the Lord Buddha (Nepal) (C 666rev)

3. **Notes** the finalization of the Integrated Management Framework (IMF) for the property, but **regrets** that, despite multiple requests, the IMF has not been formally adopted by the State Party, and therefore **reiterates its urgent request** to the State Party to adopt and implement the IMF as a matter of priority;

The Integrated Management Framework Document was adopted by the Government of Nepal in May 2022. A consultation meeting organised in Lumbini on 16 – 17 June 2022 with representatives of the Department of Archaeology, the Lumbini Development Trust, the Lumbini Cultural Municipality and UNESCO. Based on these discussions, a preliminary Action Plan has been prepared to carry out the initial steps in preparing the sector strategies and establishing the
management procedures. For the preparation of the sector strategies, the Terms of Reference for the experts have been provided.

As per the Lumbini IMF document, under section 1.6.2, the following are the key objectives for the management of Lumbini as a World Heritage property. Based on each of the key objectives, the responding actions have been formulated. A total of 39 actions have been formulated to respond to the 13 objectives of the Lumbini IMF document.

A meeting on the Management of Lumbini World Heritage Property focusing on the Priority Actions was carried out on 22 November 2022, facilitated by UNESCO expert Mr Kai Weise. This was to review the IMF document and discuss issues concerning the implementation of the provisions.

2.4 Heritage Impact Assessment

Decision: 44 COM 7B.148
Lumbini, the Birthplace of the Lord Buddha (Nepal) (C 666rev)

4. Notes with concern that development activities continue to be undertaken within the property and its buffer zone prior to notification and submission of documentation to the World Heritage Centre, and also reiterates its request to the State Party to complete Heritage Impact Assessments (HIAs) for any proposed project, […]

The Heritage Impact Assessment (HIA) procedures have been adopted by the Government of Nepal. The freshly prepared procedures will need to be tested and over time possibly amended to best suit the circumstances of the country. During two workshops, first in Lumbini on 17 June, and then in Kathmandu on 23 June, the HIA procedures were presented in detail and discussed. During the discussions in Kathmandu, a mock-trial was carried out in groups, using four case studies. The result was positive, with all the participants fully understanding the HIA procedures.

2.5 Interdisciplinary Technical Meeting

An Interdisciplinary Technical Meeting (ITM) for the Conservation of the Archaeological Remains within the Sacred Garden Lumbini, the birthplace of Lord Buddha, was held in Lumbini on 22nd and 23rd November 2022. Recommendations were made under the seven main categories:

1. that immediate measures are undertaken at the Maya Devi Shelter to better protect the archaeological vestiges;
2. that the monitoring of the archaeological vestiges is arranged immediately, particularly the impact of the microclimate created by the shelter and the visitors, while carrying out research on the degradation;

3. that mid- to long-term planning is carried out to find a more appropriate solution for the protection of the archaeological vestiges and visitor experience in lieu of the existing Maya Devi Shelter;

4. that development activities are planned within the Sacred Garden to provide improved facilities for the visitors, which must undergo Heritage Impact Assessments (HIA), and are carried out considering the protection of the known and potential archaeological vestiges, as well as the sacredness of the property;

5. that further monitoring, research and planning is carried out in the entire Sacred Garden area;

6. that subgroups, ‘Task and Finish Groups’, with interdisciplinary expertise are established to carry out the above recommended activities;

7. additional comments

To implement these points three ‘Task and Finish Groups’ were established and have had their first meetings, in preparation for the next JFIT ISC Meeting in Lumbini

1. Task and Finish Group for visitor management

Members:

- Mr. Ramesh Raj Paudel, Chief, World Heritage Conservation Section and Mr. Debendra Bhattarai, Archaeological Officer, DoA;
- Mr. Sanuraja Shakya, Member Secretary, Mr. Saroj Bhattarai, Project Chief and Mr. Gyanin Rai, Senior Administrative Officer, LDT;
- Japanese Planning Team led by Dr. Takefumi Kurose;
- Mr. Kai Weise, World Heritage Management Expert, ICOMOS Nepal;
- Ms. Nabha Basnyat Thapa, UNESCO.

2. Task and Finish Group for Archaeology and conservation, including water issues

Members:

- Mr. Ram Bahadur Kunwar, Chief, Planning Section, DoA;
- Mr. Himal Uprety, Archaeological Officer, LDT;
- Prof. Robin Coningham, International Expert in Archaeology, Durham University, UK;
- Mr. Kosh Prasad Acharya, National Expert in Archaeology;
- Dr. Costantino Muecci, International Expert in Conservation;
· Dr. Bijay Man Shakya, National Expert in Hydrology and Hydrogeology; UNESCO.

3. Task and Finish Group for defining parameters for the new shelter
   Members:
   · Dr. Suresh Suras Shrestha, Joint Secretary, MoCTCA;
   · Mr. Damodar Gautam, Director General and Chief of the World Heritage Conservation Section, DoA;
   · Venerable Metteyya, Vice Chairman, Mr. Sanuraja Shakya, Member Secretary, Mr. Saroj Bhattarai, Project Chief, Mr. Gyanin Rai, Chief Administrative Officer, LDT;
   · Prof. Yukio Nishimura, Kokugakuin University, and Dr. Takefumi Kurose, Japan;
   · Prof. Robin Coningham, International Expert in Archaeology, Durham University, UK;
   · Mr. Kosh Prasad Acharya, National Expert in Archaeology;
   · Prof. Premnath Maskey, National Expert in structural engineering;
   · Dr. Costantino Muecci, International Expert in Conservation;
   · Mr. Kai Weise, World Heritage Management Expert, ICOMOS Nepal;
   · UNESCO.

3. List of Annexures
   1. 190th Industrial Promotion Board Decision
   2. 190th Industrial Promotion Board Decision (1)
   3. Organogram 1
   4. Organogram 2
   5. Organogram 3
   6. Organogram 4
   7. Lumbini IMF 2022 17 April 2022 Final
   8. HIA NEPAL 2021 Final
   9. Air Pollution Ministry of Environment (ZIPPED FILE)
Public access to the state of conservation report

The State Party has no objection to the uploading of the full report on the World Heritage Centre’s State of Conservation Information System (http://whc.unesco.org/en/soc)

4. Signature of the Authority

[Signature]

Damodar Gautam
Director General
Department of Archaeology

1 March 2023
माननीय उद्योग मंत्री महेंद्र प्रसाद यादव ज्युको अध्यक्षतामा यसी २०६६ साल मिसिर १२ गते शुक्लारा दिनसो १.०० बजे ओकाधिक प्रबंधन बोधको १९० आै बैठक बेहाय बमोजिमका पदाधिकारीहरूको उपस्थितिमा बसी निम्न बमोजिम छलफल एवं निर्देश भएको।

माननीय श्री महेंद्र प्रसाद यादव

माननीय, श्री दान बहादुर चौधरी (कुमी)

माननीय श्री

श्री

श्री कुमार सिंह राठैको

श्री उद्योग मंत्रालय

श्री राज्य मंत्री, उद्योग मंत्रालय

श्री राष्ट्रिय योजना आयोग (उद्योग हेतु)

श्री गायन राष्ट्र बैंक

श्री सचिवालय अर्थ मंत्रालय

श्री सचिवालय वातावरण मंत्रालय

श्री सचिवालय उद्योग मंत्रालय

श्री सचिवालय, वाणिज्य तथा आपूर्ति मंत्रालय सदस्य

श्री सचिवालय, भौतिक योजना तथा निर्माण मंत्रालय सदस्य

श्री सचिवालय, उद्योग मंत्रालय सदस्य

श्री सचिवालय, वन तथा भू संरक्षण मंत्रालय सदस्य

श्री सचिवालय, श्रम तथा यातायात व्यवस्था मंत्रालय सदस्य

महामन्त्रीस्वरुप छरेलु तथा साना उद्योग विभाग सदस्य

विद्रोह, नेपाल उद्योग वाणिज्य महासचिव सदस्य

विद्रोह, नेपाल छरेलु तथा साना उद्योग महासचिव सदस्य

विद्रोह, नेपाल उद्योग परिषद् सदस्य

देखि यूनियन प्रतिनिधि सदस्य

देखि यूनियन प्रतिनिधि सदस्य

नेपाल समावेशी देखि यूनियन महासचिव सदस्य

निद. महानिर्देशक, उद्योग विभाग सदस्य

सह सचिव, उद्योग मंत्रालय, ओकाधिक प्रबंधन महागाघातीको उद्योग मंत्रालय (योजना महागाघात)

सहसचिवालय, उद्योग मंत्रालय (प्रशासन तथा संभाषण महागाघात)

कानून अधिकारी, उद्योग मंत्रालय
विश्व समावा सूचिकृत पर्यटकीय तथा धार्मिक स्थलको स्थान लुम्बिनी दरियार र स्थापना हुने उद्योगहरूले लुम्बिनी उद्योगको विविध बनाउँदै गरेकोले उत्तर क्षेत्रमा स्थापित उद्योगहरूले गन्पुर तथा नयाँ उद्योगहरूले स्थापना गर्न अनुमति भएको तथा द्वारा प्रवास नगरी मान सहित लुम्बिनी विकास कोष, ल्यस क्षेत्रमा कायरति संघ, संस्थात तथा समद्धि अथवा नियोक्ताैतिशात व्यवस्था कार्य भएको मैरिनको अन्तर, रोकाणका उद्यान र उत्तर क्षेत्रमा नयाँ उद्योगहरूले स्थापना गर्न दिने/नलिने, भई रहेको उद्योगहरूले स्थायित्वका कस्तो व्यवस्था गर्न बारे स्थलात अनुमति गरी स्थलात सहितको प्रतिवेदन पर्ने गर्न आधिकारिक प्रबिध बोर्डको ९४४ अधिकारको कार्यक्रम तीनी गदन भएकोमा उत्तर टोलीको विवृति सहितका आधारमा लुम्बिनी क्षेत्रको संरचनामा लागि व्यावसायिक पर्ने कसरी निर्णय गर्न भने समबन्धमा हलकल हुन देखिएको माध्यममा गरी निर्णय भन्ने।

क. लुम्बिनी क्षेत्र संरचनामा निर्मित निर्मित व्यवस्थाभित बीचको विनाश मध्ये भारतीय सीमामा र पूर्व विश्वका धर्म तथा साहित्यका सार्वजनिक खुलासा। यसको वर्तमान विवादमा ५०० मिट धारण नगरी मान उद्योग वाहक अन्तर नयाँ उद्योग स्थापना गराउने।

ख. साथि उल्लिखित लुम्बिनी क्षेत्रको ५५ कि.मि. भूभेद भन्ने धर्ता भई संचालन उद्योगहरूले उद्योग स्थानान्तरण तथा प्रदुषण नियन्त्रण सम्बन्धमा प्रदुषण नियन्त्रण गर्न उद्योगहरूले उद्योग सामाजिक संरचना एउटा तीनको प्रदुषण नियन्त्रण, मापदंड (Parameter) र विवृति सहित गर्न माथि उद्योग संचालन गर्नुहोस्। प्रदुषण नियन्त्रणका मापदंड एवं शर्तहरू पुरा गर्ने उद्योग सम्बन्धमा हलकल गरी २ वर्ष भनि उद्योग स्थानान्तरण गरिएको जस्तै गरेको। साथि यस क्षेत्रमा संचालन उद्योगहरूले पूर्णी व्यूह, भव्यता व्यूह, उद्देश्यका धर्म तथा विवृति स्थलका धर्म नगरी नीति कायम गरेको।

ग. लुम्बिनी क्षेत्रमा धर्मस्थल तथा काठिय उद्योगहरूले स्थापनाको लागि IEE गन्पुरमा भएको IEE समितिमा लुम्बिनी विकास कोषका प्रतिनिधिलाई समेत समवेदन गर्नुहोस्।

घ. भैरव का लुम्बिनी सडकको विमानस्थल खोजकसम्मका क्षेत्रमा नयाँ उद्योग स्थापना गरेको, भैरवका उद्योगहरूले पूर्णी व्यूह, भव्यता व्यूह, उद्देश्यका धर्म तथा विवृति स्थलका धर्म गरेको IEE/EIA गरु पनि भएमा IEE/EIA कमिटेमा लुम्बिनी विकास कोषका प्रतिनिधिलाई राख्नुहोस्।

ड. उल्लिखित ५५ कि.मि. भूभेद दरी स्थलका तर संचालन पद्धतीमा उद्योगहरूले हलकल समेत त्यस्ता उद्योग संचालन तौरमा प्रदुषण, मापदंड एवं शर्तहरू प्रकाशी गरेको उद्योग स्थानान्तरण गर्ने आवश्यक प्रदुषण नियन्त्रणको व्यवस्था गर्नु पनि भएको। तीनको मापदंड एवं शर्तहरू पलायन नगरी मान उद्योगहरूलाई दिएको समयवधि भनि अन्य व्यवस्थान्तरण गरेको।

२. निर्णय नं. २

केन्द्रीय निजलाईको महत्त्वपूर्ण संचालन एसिस्टेंट पेपरमिलिनिक निथिकाङ्गको विवाद भयाम तथा फाइड पारीको व्यवस्थापन तार्किक बालिका प्रदुषण मान धनको स्वायत्तता प्रदुषण असर पर्ने तथा कार्य पारी न्यर्गम मिश्रित घरपलाई जीवनतब्रह्मको मूल्य नेको र
### Security Section

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Information, Public relation and Hospitality Section

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LUMBINI DEVELOPMENT TRUST

Archaeology Division
Gazetted-Second Class

- Archaeological Officer (Lumbini) Gazetted-Third Class (Technical)
- Archaeological Officer (Kapilvastu) Gazetted-Third Class (Technical)
- Archaeological Officer (Ramgram-Devdaha) Nongazetted-First Class (Nayab Subba)
- Museum Officer Gazetted-Third Class (Technical)

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LUMBINI DEVELOPMENT TRUST
LUMBINI

Planning, Construction and Garden Division

Physical Planning, Infrastructure building and Maintenance Section

Forest and Gardening Section

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LUMBINI, BIRTHPLACE OF THE LORD BUDDHA, WORLD HERITAGE PROPERTY

INTEGRATED MANAGEMENT FRAMEWORK

APRIL 2022

The inner Sacred Garden looking north towards the Peace Pagoda (Image: Gyanin Rai)

Lumbini Development Trust

in close collaboration with the

Government of Nepal
Ministry of Culture, Tourism and Civil Aviation
Department of Archaeology

World Heritage Centre and UNESCO Office in Kathmandu
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The Sector Strategy Plans will be annexed to this document as part of the Integrated Management Framework. These will include the Archaeology Strategy, the Local Development Strategy, the Disaster Risk Management Strategy, the Visitor Management Strategy and the Strategy for Buddhist Organisations.
1. IDENTIFICATION and OBJECTIVES

1.1 INTRODUCTION

The “Integrated Management Framework” for Lumbini, the Birthplace of the Lord Buddha, is a document adopted by the Government of Nepal. It defines the frameworks within which the “Integrated Management Process” is implemented and constitutes the “Management Plan” as requested by the World Heritage Committee.

Need for the Integrated Management:
Every World Heritage property requires a clearly defined management system: “To be deemed of Outstanding Universal Value, a property must also meet the conditions of integrity and/or authenticity and must have an adequate protection and management system to ensure its safeguarding.” (Article 78, Operational Guidelines for the Implementation of the World Heritage Convention). The requirements for the management systems are defined in articles 108 to 118 of the Operational Guidelines.

The World Heritage Committee has specifically requested the State Party to prepare an integrated management plan. In 2002, the World Heritage Committee requested information on the management that ensures the protection of the World Heritage values of the property. Since 2004, the World Heritage Committee has repeatedly requested the elaboration of a comprehensive conservation and management plan.

In 1997 the World Heritage Committee inscribed Lumbini on the World Heritage List. At the time it was suggested that other important sites in the region be considered for nomination in future. “The Delegate of Thailand declared that apart from Lumbini, there are two other sites closely associated with Buddha which are in the process of preparation to be presented as serial nominations and that he hoped that the Committee would consider them in this context” (21COM VIIIC Decision Text). The Integrated Management Framework has taken this into account and has addressed the need to consider Lumbini and its surroundings at various scales: the World Heritage property, the buffer zone, the Sacred Garden, the Project Area, the Lumbini Master Plan Area, as well as the Greater Lumbini Area.


This document is comprised of three parts:

Part 1: Identification and Objectives
This section defines Lumbini, the Birthplace of the Lord Buddha as per the Statement of Outstanding Universal Value and defined property boundary, buffer zone and Protected Monument Zone. The management objectives are provided.

Part 2: Integrated Management Framework
This section provides the management structure required to address the defined objectives. The institutional, legal and resource frameworks are defined.

Part 3: Implementation
This section addresses the establishment and long-term implementation of the Integrated Management Framework based on the institutional, legal and economic frameworks, the sector-wise coordination and the monitoring framework.

The Integrated Management Process: Based on the Integrated Management Frameworks and as per the requirements of the objectives, management processes are to be established. All activities carried out within the Sacred Garden area, and activities in the Greater Lumbini Area that could negatively impact the Lumbini World Heritage property, or other identified heritage sites, will strictly follow the defined processes.

The Integrated Management Process must be seen as a road map towards achieving the goal of conserving the outstanding universal value of Lumbini, the Birthplace of the Lord Buddha.
1.2 DEFINING THE PROPERTY

The property has been defined through the Statement of Outstanding Universal Value (OUV) prepared by the State Party retrospectively in 2011 and adopted by the World Heritage Committee during the 36 Session in 2012 (36 COM 8E).

Statement of Outstanding Universal Value
Name of the property: Lumbini, the Birthplace of the Lord Buddha
Date of Inscription: 1997

Brief Synthesis:
Siddhartha Gautama (Sakyamuni Buddha) was born in 623 BC in the garden of Lumbini located in the Terai plains of mid-western Nepal, testified by the inscription on the pillar erected by the Mauryan Emperor Asoka in 249 BC. Lumbini is one of the most sacred places of one of the world’s great religions, and its remains contain important evidence about the nature of Buddhist pilgrimage centres from as early as the 3rd century BC.

The complex of structures within the archaeological conservation area includes the Shakya Pond (Pushkarani), the remains within the Mayadevi Temple consisting of brick structures in a cross-wall system dating from the 3rd century BC to the present century and the sandstone Asoka pillar with its Pali language inscription in Brahmi script. Additionally, there are the excavated remains of Buddhist viharas (monasteries) of the 3rd century BC to the 5th century AD and the remains of Buddhist stupas (memorial shrines) from the 3rd century BC to the 15th century AD. The site is now being developed as a Buddhist pilgrimage centre, where the archaeological remains associated with the birthplace of the Lord Buddha form a central feature.

Criterion (iii):
As the birthplace of the Lord Buddha, testified by the inscription on the Asoka pillar, the sacred area in Lumbini is one of the most holy and significant places for one of the world’s great religions.

Criterion (vi):
The archaeological remains of the Buddhist viharas (monasteries) and stupas (memorial shrines) from the 3rd century BC to the 15th century AD provide important evidence about the nature of Buddhist pilgrimage centres from a very early period.

Integrity:
The integrity of Lumbini has been achieved by means of preserving the archaeological remains that give the property its outstanding universal value within the boundaries. The significant attributes and elements of the property have been preserved. The buffer zone gives the property a further layer of protection. Further excavations of potential archaeological sites and appropriate protection of the archaeological remains are a high priority for the integrity of the site. The boundaries however do not include the entire archaeological area and various sites are found in the buffer zone. The entire property is owned by the Government of Nepal and is being managed by the Lumbini Development Trust established as per the Lumbini Development Trust Act 1985 and therefore there is little threat of development or neglect. However, the effects of industrial development in the region have been identified as a threat to the integrity of the property.

Authenticity:
The authenticity of the archaeological remains within the boundaries has been confirmed through a series of excavations since the discovery of the Asoka pillar in 1896. The remains of viharas, stupas and numerous layers of brick structures from the 3rd century BC to the present century at the site of the Mayadevi Temple are proof of Lumbini having been a centre of pilgrimage already from early times. The archaeological remains require active conservation and monitoring to ensure that the impact of natural degradation, influence of humidity and the impact of the visitors are kept under control.
Management:
The entire site is owned by the Government of Nepal. The site management is carried out by the Lumbini Development Trust, an autonomous and non-profit making organization established as per the Lumbini Development Trust Act 1985. The main archaeological site is protected as per the Ancient Monument Preservation Act 1956. The site falls within the centre of the Master Plan area, the planning of which was initiated together with the United Nations and carried out by Prof. Kenzo Tange between 1972 and 1978.

The long-term challenges for the protection and management of the property would be to control the impact of the visitors, of natural impacts such as humidity and the industrial development in the region. A Management Plan is in the process of being developed to ensure the long-term safeguarding of the archaeological vestiges of the property while allowing for the property to continue being visited by pilgrims and tourists from around the world.

OUTCOME OF RECENT ARCHAEOLOGICAL INVESTIGATIONS IN LUMBINI

Supported by the Japanese-Funds-in-Trust-for-UNESCO between 2010 and 2013, archaeological survey and fieldwork within the Levee was carried out by the UNESCO Chair, Durham University, the Department of Archaeology, Government of Nepal and the Lumbini Development Trust, and the following key discoveries were made:

The foundations of the 'Mauryan' temple exposed by the Japanese Buddhist Federation and Department of Archaeology, Government of Nepal, were found to have been associated with timber and lime plastered walls covered with ceramic roof tiles around an open centre. On examination, the Mauryan temple was found not to have been the first structure built in that locality. Indeed, it was found to have carefully enshrined an earlier brick-built platform of exactly the same footprint measuring 26 by 21 metres some 50 cm below its surface. This earlier structure had been built of very large brick measuring 52 by 38 by 7.5 cm with a distinctive double brick on edge kerb close to the platform's centre marking the presence of an open space. A cardinal line of postholes was exposed on the removal of the kerb, indicating an earlier structure of the same alignment and location. Dating to the sixth century BCE, geoarchaeological analysis has indicated that this central space had been consistently left unroofed and that its soil had been artificially enhanced. The presence of root systems within the stratigraphy and soil sections suggests the presence of a tree in this location.

The foundations of brick-built monasteries to the south of the Maya devi Temple were found to have been preceded by timber post structures as early as the sixth century BCE. The absence of manufacturing and animal bones from this locality is striking different from the rich residential deposits to the southwest in the Village Mound.

The ‘Village Mound’, to the southwest of the Mayadevi Temple, contains a residential settlement which was occupied from as early as the c. 1300 BCE until sixth century CE. It is unfortunate that engineering works supervised by the site manager on the levee in 2009 and 2022 have destroyed part of the Village Mound’s eastern and southern edges. While the removal of the Police Station from the centre of this ancient settlement lessened the impact of residents on the mound, clearance and beautification in 2022 using tracked excavators has caused damage to the surface.

The Helipad, to the southeast of the Mayadevi Temple, was also found to contain significant in situ archaeological deposits. This comprised a large brick monument measuring some seven metres by three metres near the ground surface. Dating to between the seventh and eighth centuries CE, it overlay an earlier sequence of charcoal, numerous ceramic sherds,
including distorted, overfired and deformed examples, dating to the seventh and eighth centuries BCE – indicating the potential presence of an Early Historic pottery workshop.

The distinctive ‘Nursery Well’ in the gardens of the residence of Lumbini Development Trust’s Vice Chairman to the southwest of the levee, dates to between the fifth to sixth centuries CE. Constructed from rings of distinctively stamped and inscribed concave-shaped bricks, the discovery of an identical well at the site of Motipur 9.58 kilometres to the west indicates the presence of a major route with infrastructure, associated it is with walled enclosure on the same alignment to the east of Lumbini.

Geophysical survey and auger coring has indicated the presence of cultural materials and landscape features across much of the area enclosed within the levee. This ranges from isolated deposits of bricks to environmental features, such as the Palaeochannel located to the northwest of the Mayadevi Temple at a depth of four metres below the current ground surface. It provided evidence of a natural water channel flowing across the site in ninth century BCE, later silted and filled by eighth century CE. The vulnerability of this subsurface archaeology to intrusive activities, such as the cutting or recutting of paths, drains and pipes, was also highlighted during the cutting of drains by the site manager to the west of the Mayadevi Temple when an unrecorded brick structure was destroyed by the use of tracked excavators in 2016.

Archaeological Risk maps of the site were prepared in 2012 and updated in 2013 to show the most vulnerable archaeological deposits and shared with both the State Party and site manager.

The Archaeological Risk Map of Lumbini / UNESCO Chair, Durham University
1.3 BOUNDARY and BUFFER ZONE

The World Heritage boundaries of Lumbini, the Birthplace of the Lord Buddha is restricted to an area of 130 by 150 meters around the Asoka pillar. The buffer zone extends to the area within the water body as demarcated in the Lumbini Master Plan. The Sacred Garden area is to be declared a Protected Monument Zone.

Boundaries
The World Heritage boundary encompasses an area of 130 by 150 meters which includes the Asoka pillar, the Shakya pond and the archaeological vestiges of viharas and stupas around the Mayadevi shelter. However, it does not include extensions of these archaeological sites to the north, west, southwest and southeast. Furthermore, the boundary does not encompass the Village Mound nor the Helipad areas towards the southeast.

Buffer Zones
The buffer zone is defined by the area within the water body as demarcated in the Lumbini Master Plan. At the time of inscription, the water body had not yet been excavated. It was assumed that such a radical intrusion within the existing natural surrounds would hardly have been allowed within the World Heritage buffer zone and therefore this area was excluded from even the buffer zone. For the long-term protection of the property, it is essential that the entire Sacred Garden area is protected and shielded from the pressures of inappropriate development.

Clarifications
The State Party submitted a request for minor modification of the boundary in February 2010, to enlarge the World Heritage property to include the entire area within the water body and enlarge the buffer zone to include the entire Sacred Garden area, which was “supported in principle” but not approved by the World Heritage Committee (Decision 34 COM 8B.54). The previous boundary and the buffer zone were clarified by the State Party in response to the Retrospective Inventory and this was taken note off by the World Heritage Committee during its 36th Session in 2012 (36 COM 8D).
Protected Monument Zone

The Sacred Garden of Lumbini, comprising an area of 1600 by 1360 meters, which contains the World Heritage property and the buffer zone, will be declared a Protected Monument Zone as per the Ancient Monument Preservation Act 1956. This area will be strictly protected from any inappropriate developments, especially those that might threaten the outstanding universal value of the World Heritage property. The site management is carried out by the Lumbini Development Trust, as per the Lumbini Development Trust Act 1985.

Adjoining to the north is the monastic zone of the Lumbini Master Plan. To the east is the straight road from Parsa to Lankapur. To the south is the straight road from Lankapur to Padariya Chowk. To the west is the straight road from Padariya Chowk to Lokaria Chowk.

The coordinates of the four corners of this area are:

- 27°28'28.56"N 83°16'4.10"E
- 27°28'28.62"N 83°17'1.88"E
- 27°27'45.40"N 83°16'3.50"E
- 27°27'45.80"N 83°17'0.10"E
1.4 THE LAYERS OF COMPREHENSION

Due to the universal significance of Lumbini, there are numerous approaches to view and interpret this sacred place. Each of these perceptions is valid and must be incorporated into the overall understanding of the Sacred Garden.

1. **Lumbini in Buddhist Literature:** The Buddhist texts were first written down in Pali in the 1st century BCE and others followed in Sanskrit, with Tibetan and Chinese translations. Through the centuries further commentaries and embellishments were added. In various texts (such as the Digha Nikaya and the Samyutta Nikaya of the Sutta Pitaka and the Vinaya Vastu) Lumbini is described, interpreted and projected. These texts give a sense of what Lumbini is considered to be from the religious perspective.

2. **Lumbini in Historical Texts:** The early historical documentation of the site is limited to the brief travel itineraries written by Chinese travellers such as Seng Tsai (350-375 CE), Fa-Hsien (403/409 CE) and Hiuen Tsang (636 CE). Lumbini was re-discovered in 1896 and there is limited documentation on the activities carried out during the various phases of early investigations, beautification and the increasingly improved scientific research.

3. **Archaeology and Site Interpretation:** The site itself tells a story that has been unfolding for over two and a half thousand years. This story can be read by interpreting the evidence that has accumulated over time. The potential archaeological sites need to be further surveyed, excavated, analysed and interpreted by a multi-disciplinary team to widen the understanding of the cultural and natural history of the site.

4. **The Lumbini Master Plan:** The Master Plan, prepared by Kenzo Tange between 1972 and 1978, defines the concept for the physical plan and the extent of the Sacred Garden. A water body and levee define an inner garden with the main archaeological site around the Asoka Pillar and an outer area is left as a natural forest. A grid of service roads was to be provided, however, with strict instructions not to carry out any activities that could harm archaeology.

5. **Lumbini as World Heritage:** An area of 130 by 150 meters was inscribed on the List of World Heritage in 1997 with the remaining inner Sacred Garden being the buffer zone. These original boundaries do not contain all the attributes of the archaeological site and the entire Sacred Garden of 1360 by 1600 meters must be protected. The conservation approach for Lumbini must be based on the objective of preserving the outstanding universal value of the property.

6. **The Environment of Lumbini:** The Sacred Garden mirrors the importance of the natural environment in the life of Lord Buddha. The physical planning of the Sacred Garden must take into account the historical, religious and existing status of the environment. The “garden” or “forest” must retain a natural balance considering the climate, hydrology, fauna and flora of the region to create a sacred landscape, with the need to preserve both historic and indigenous tree and plant species.

7. **Activities in Lumbini:** The site must cater to the desires of pilgrims and tourists, allowing them to carry out various activities. A wide range of activities can be identified, such as to meditate, pray, give offerings, burn lamps and incense, collect soil and leaves, etc. However, activities being carried out within the same area and the required facilities could create conflicts between the various groups of pilgrims and might even impact the archaeological remains and sanctity, authenticity and integrity of the sites.

8. **Expectations on Lumbini:** What are the expectations of the pilgrims, the tourists, the managers, the experts and the stakeholders? The expectations are based on some or all of the above-mentioned issues and how these issues are going to be addressed to create a harmonious and sacred place. The expectations of the visitor will need to be fulfilled by resolving the conflicting issues and enhancing the cumulative impression created to express the character of the site.
1.5 SUSTAINABLE DEVELOPMENT

Sustainable Development must be pursued around Lumbini, the Birthplace of the Lord Buddha, World Heritage property. This means that conservation of cultural and natural heritage must go hand-in-hand with social and economic development, taking into account the needs of future generations.

The Brundtland Commission defined Sustainable Development as, “development that meets the needs of the present without compromising the ability of future generations to meet their own need”. Sustainable Development is considered to be based on the following three policy areas or “pillars”; economic development, social development and environmental protection. The inclusion of culture (or cultural diversity) can be an integral part of our environment or even as the fourth pillar of Sustainable Development. By inclusion of culture – especially in respect to heritage conservation – the definition of Sustainable Development embraces a whole new dimension; that of our past.

Lumbini, the Birthplace of the Lord Buddha World Heritage Property is under great pressure to change. This change needs to be directed along the principles of Sustainable Development while ensuring the protection of the OUV. This means that conservation of cultural and natural heritage must go hand-in-hand with social and economic development, taking into account the needs of future generations.

Sustainable Development Goals (SDGs) and management of World Heritage

Para 36 of the 2030 Agenda for Sustainable Development Declaration states; ‘We pledge to foster intercultural understanding, tolerance, mutual respect and an ethic of global citizenship and shared responsibility. We acknowledge the natural and cultural diversity of the world and recognize that all cultures and civilizations can contribute to, and are crucial enablers of, sustainable development’. The SDG goals and targets are relevant to the management of Lumbini, the Birthplace of the Lord Buddha, World Heritage property, allowing resources to achieve the SDGs to be utilized.

Many of the 17 Sustainable Development Goals and 169 targets are relevant for Lumbini. Within these are several targets that are specifically linked to culture and cultural heritage.

Goal 4:
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all;

Goal 8:
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;

Goal 11:
Make cities and human settlements inclusive, safe, resilient and sustainable;

Goal 12:
Ensure sustainable consumption and production patterns;

Goal 17:
Strengthen the means of implementation and revitalize the global partnership for sustainable development.
1.6 OBJECTIVES OF THE IMF

1.6.1 OBJECTIVE STATEMENT

The primary objective of the Integrated Management of Lumbini, the Birthplace of the Lord Buddha is to protect the Outstanding Universal Value of the World Heritage property as well as to ensure that Lumbini becomes the catalyst for the sustainable development of the Greater Lumbini Area.

A Management plan can be understood as an operational instrument to utilize available resources to protect defined OUV, while responding to circumstances in the given context.

The principles that are to be observed in achieving the management goals are:

**Significance-driven**
The concern for the conservation of the significance of the site is at the core of decision-making and must be balanced against the interests of other sectors.

**Integrated approach**
The Integrated Management Framework will follow a systemic and holistic approach to conservation, taking into account the significance of the archaeology, the cultural and natural context within which they are found and the living heritage that lends them their local value.

**Process oriented**
The Integrated Management Framework will focus on the processes and linkages between the components of the site and the various actors to allow realistic long-term implementation.

**Sustainability**
The Integrated Management Framework will be prepared and implemented based on an understanding of sustainability: economic, social, environmental, as well as cultural.

To achieve the objectives of the Integrated Management Framework of Lumbini, the provisions given in the Integrated Management Framework document will be followed, as defined by the institutional, legal and resources frameworks, and the related procedures and sector strategies.
1.6.2 KEY OBJECTIVES
The following are the Key Objectives for the Management of Lumbini

OBJECTIVE 1: To identify the attributes and elements that give Lumbini its Outstanding Universal Value, define authenticity and integrity for the site and possibly redefine the boundaries and buffer zones to best define the heritage property while providing the required protection.

OBJECTIVE 2: To prepare a plan that provides guidelines and regulations for the physical development of the entire Sacred Garden which ensures the preservation of its Outstanding Universal Value (OUV), provides for the requirements of pilgrims and visitors, an appropriate environment and identifies the means of implementing the plan.

OBJECTIVE 3: To determine an appropriate long-term solution for safeguarding the archaeological vestiges in and around the Mayadevi temple which includes an in-depth understanding of the threats to the archaeological remains and appropriate provisions for pilgrims and to identify the means of implementing this solution.

OBJECTIVE 4: To carry out further detailed archaeological investigations of highest scientific standard including documentation and analysis, provide appropriate and adequate means of conserving the archaeological remains within the Sacred Garden and where necessary throughout the Master Plan area, and to identify the means of implementing these projects.

OBJECTIVE 5: To provide for the needs of the pilgrims taking into account the impact these activities and required facilities have on other visitors, the archaeological remains and the authenticity and integrity of the Sacred Garden and to identify the means of implementing these provisions.

OBJECTIVE 6: To determine the means of implementing the Lumbini Master Plan, as the basis for defining the development in the area around the World Heritage property.

OBJECTIVE 7: To redefine the Lumbini World Heritage Site boundaries and buffer, considering the preparation of the Tentative List sites of Tilaurakot and Ramagram for nomination, placing further important Buddhist sites on the Tentative List.

OBJECTIVE 8: To carry out archaeological research and conservation throughout the Greater Lumbini Area, stretching from Kapilbastu, to Rupendehi and Nawalparasi, (Bardaghat Susta West) and establish an Integrated Plan and provide for the implementation of the plan.

OBJECTIVE 9: To identify means of ensuring the appropriate development of the Greater Lumbini Area by prioritizing conservation.

OBJECTIVE 10: To facilitate strategies for improving the socio-economy of the local communities and to develop tourism and pilgrimage by means of improving facilities, services, infrastructure and accessibility of heritage sites in the Greater Lumbini Area.

OBJECTIVE 11: To ensure the serenity and sanctity of the natural and cultural heritage, particularly the Buddhist sites and local tangible and intangible traditions of the region’s diverse local communities in and around Lumbini, by protecting the environment, controlling the threat of natural disasters and introducing legal provisions and means of enforcing them.

OBJECTIVE 12: To establish coordination between all international partners, the national authorities and the site managers.

OBJECTIVE 13: To clarify that Lumbini Development Trust is responsible for the management of the World Heritage property.
# 2. INTEGRATED MANAGEMENT FRAMEWORK

## 2.1 INSTITUTIONAL FRAMEWORK

### 2.1.1 THE AUTHORITIES AND THE SITE MANAGER

The ‘State Party’ is represented by the Department of Archaeology, under the Ministry of Culture, Tourism and Civil Aviation. Lumbini Development Trust, under the same ministry, is the World Heritage Site Manager.

**Central Government (Focal Point)**

The authority within the central government that is responsible for heritage conservation (and the World Heritage Site) is the Department of Archaeology (DoA), under the Ministry of Culture, Tourism and Civil Aviation. The *Heritage Conservation Section* of the Department of Archaeology deals with cultural World Heritage.

### World Heritage Site Managers

The responsibility of Site Management has been given to the Lumbini Development Trust. The Lumbini Development Trust has also the responsibility of managing the entire Lumbini Development Area which encompasses archaeological sites stretching out in three districts – Kapilbastu, Rupendehi and Nawalparasi (Bardaghat Susta West).

The responsibility of managing the World Heritage property has been specifically taken by the Lumbini Development Trust. A dedicated Lumbini World Heritage Office will be established to coordinate all relevant activities. The chain of command, the communication system and the reporting procedures will be identified and documented to ensure the required coordination amongst all offices within Lumbini Development Trust.

### The Greater Lumbini Area

The governance of the Greater Lumbini Area will be carried out under special provisions adopted by the Government of Nepal. Development will take place based on the concept of conserving the heritage sites, particularly the numerous archaeological sites in the region. An appropriate system of governance will be established to ensure the sustainable development of the region spanning across the three districts of Kapilbastu, Rupendehi and Nawalparasi (Bardaghat Susta West).

### Responsibilities of the Lumbini World Heritage Site Management:

- To identify the attributes and elements that give Lumbini its outstanding universal value, including its authenticity and integrity.
- To coordinate the implementation of the applicable legislation and the guidelines for the physical development of the Sacred Garden;
- To monitor the exposed and conserved archaeological remains within the Sacred Garden;
- To monitor and manage the pilgrims and visitors within the Sacred Garden;
- To carry out weekly monitoring and prepare weekly monitoring reports;
- To monitor all works within the Sacred Garden to ensure process, HIA and avoid damage to subsurface heritage;
- To review and revise the Plan of Action and prepare Annual Action Plans;
- To carry out risk management and emergency response to disasters;
- To coordinate with all relevant “actors” within the World Heritage area and the Sacred Garden, in particular with the Department of Archaeology;
- To maintain close communication with the World Heritage Centre and the UNESCO Office in Kathmandu;
- To maintain a documentation centre including the maintenance of a database of all communications linked to World Heritage;
- Prepare, coordinate and submit required reports to the World Heritage Centre as requested by the World Heritage Committee;

The Focal Point and Site Manager will be given adequate capacity, training and resources to be in a position to fulfil their tasks.
2.1.2 ASSOCIATED AUTHORITIES

There are government authorities from other sectors that carry out work in the Greater Lumbini Area. Through the adoption of the Integrated Management Framework by the Government of Nepal, associated authorities (ministries and departments in the central and provincial governments, local authorities and line agencies) are made party to the implementation of the Integrated Management. The Government of Nepal will notify all associated authorities, simultaneously establishing a consultation and conflict resolution process.

GENERAL PROVISION

All government authorities at central, provincial and local level, when carrying out activities within the Greater Lumbini Area, that could affect heritage sites, will coordinate with the Department of Archaeology and the Lumbini Development Trust. These would particularly include the ministries dealing with local development, urban planning, physical planning, survey, land reform and management, agriculture, forest, environment, roads and other forms of infrastructure development works, etc. The activities might be those that could have an adverse impact on the Sacred Garden of Lumbini, or provided additional support to the safeguarding of the World Heritage.

CENTRAL GOVERNMENT

All central government ministries and related departments, authorities and commissions, etc. that carry out activities within the Greater Lumbini Area, will be considered Associated Authorities.

PROVINCIAL GOVERNMENT

The provincial level government has been established based on the 2015 Constitution of Nepal. The Government of Lumbini Province will be essential to coordinate activities within the Greater Lumbini Area. All provincial government ministries and related departments, will be considered Associated Authorities.

DISTRICT LEVEL GOVERNMENT

The district level government, though largely reformed by the 2015 Constitution of Nepal, still plays a role, particularly through the powers vested in the Chief District Officer (CDO). Lumbini is located within the Rupendehi District, with the Greater Lumbini Area extending to Kapilbastu to the west and Nawalparasi (Bardaghat Susta West) to the east.

LOCAL GOVERNMENT

The local level government, as per the provisions of the 2015 Constitution of Nepal, consists of urban and rural municipalities. The World Heritage property of Lumbini, the Birthplace of the Lord Buddha, is located within the Lumbini Cultural Municipality. The coordination between the municipality and Lumbini Development Trust is essential, particularly for the planning of the area surrounding the Sacred Gardens to the east, south and west.

LINE AGENCIES

Infrastructure and service projects are also carried out by the line agencies. This would in particular mean the line agencies, including semi-private and private entities that provide electricity, telecommunication and water supply, as well as manage sewer, drainage and solid waste.
2.1.3 INTERNATIONAL INVOLVEMENT

The international community has been involved in Lumbini since its re-discovery in the late 19th century. With the inscription of Lumbini on the List of World Heritage, the international community has a further responsibility for safeguarding the outstanding universal value of the property.

The United Nations System

U. Thant, UN Secretary General, who visited Lumbini in 1967 called upon the International Community to help develop Lumbini. This led to the establishment of the International Committee for the Development of Lumbini, formed under the auspices of the United Nations in 1970 (comprising of Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, the Lao People’s Democratic Republic, Malaysia, Myanmar, Nepal, Pakistan, the Republic of Korea, Singapore, Sri Lanka and Thailand).

Under this organizational setup, in 1972 Kenzo Tange was commissioned to prepare the Master Plan for the Development of Lumbini which was finalized in 1978 (Phase II). Work started with major contributions from UNDP and the Japan EXPO Foundation. According to the initial schedule, all major construction works was to be completed by 1985. However due to lack of resources with dwindling interest by the international organizations and poor management, progress was slow.

The UN system however continued to be involved in a drastically reduced form. UNDP has more recently funded projects such as the development review mission in 1999 and the Tourism for Rural Poverty Alleviation Programme (TRPAP). Since 2005 there have been various efforts to revive the International Committee.

Lumbini was put on the List of World Heritage in 1997, whereby the international community contributes to the safeguarding of the outstanding universal value of the property. Since 2010 UNESCO, with the support of the Japanese Government, has been carrying out the UNESCO/JFIT project comprising of project components in archaeological, conservation, planning and management.

International Contributions

There was international involvement in various development projects that were carried out such as the library building and the Museum, both completed in 1989. The Pilgrim Accommodation was competed in 1986 (but was never operational). There was further international involvement in the construction of the Hokke Hotel, the Peace Stupa and in the excavation of the Sacred Garden. The International involvement continues with the implementation of the individual sites in the Monastic zone.

The most effective project for Lumbini and the archaeological sites withing the Greater Lumbini Area has been the UNESCO/Japanese Funds in Trust project. This project has been running since 2010, and has dealt with archaeology, conservation, planning and management, including the finalization of the Integrated Management Framework document.

International Archaeological Research

International Cooperation in finding, studying and developing Lumbini goes back to 1896 when expert with various nationalities were involved in identifying the location of Lumbini. Various excavations, surveys and research have been carried out in partnership with international teams.

The Government of Nepal will continue supporting appropriate archaeological research to be carried out together with reputed and qualified international partners.
2.2 LEGAL FRAMEWORK

2.2.1 LEGISLATION AND LEGAL PROVISIONS

The Lumbini Development Trust Act (1985) is a specific act for the implementation of the Lumbini Development Plan and management of all sites directly or indirectly related to the life of Buddha. The principal Act relevant to the conservation of heritage is the Ancient Monument Preservation Act (1956).

Lumbini Development Trust Act 1985 – Second Amendment 1993

The Lumbini Development Trust Act (LDTA) 1985 is an Act made to provide for the Lumbini Development Trust (LDT). The Act has been amended in 1991 and the second amendment was made in 1993. LDT is a non-profit making institution, an autonomous and corporate body with perpetual succession. The LDTA is a specific act for the implementation of the Lumbini Development Plan which would encompass the Lumbini Development Area which includes places directly or indirectly related to the life of the Lord Buddha, stretching from Kapilbastu, through Rupendehi to Nawalparasi (Bardaghat Susta West). The objectives of LDT are to obtain funds, provide funds for implementation and check on the proper utilization of funds. LDT may introduce changes in the work plan if so, deemed necessary in the interest of the Plan. LDT may establish committees and subcommittees to implement their work while keeping close relationship with the Government.

The Lumbini Monastic Zone Bylaws 2002 provides for development controls for the construction of monasteries within the Monastic Zone of the Lumbini Master Plan area.

Ancient Monument Preservation Act 1956 - Fifth Amendment 1996

The legislation for the conservation, protection and management of cultural property is based on the Ancient Monument Preservation Act (AMPA) 1956, its subsequent amendments (the latest having been the fifth amendment in 1996) and the Ancient Monument Preservation Rules 1988. The Ancient Monument Preservation Act gives the legal provisions to declare a monument or area to be a Protected Monument Zone (PMZ). The Department of Archaeology is subsequently responsible for the protection of the site, including controlling all archaeological excavation works, the prescription of building bylaws, approving requests for building permits and for any other construction activities within the zone.

Associated Legislation

The Constitution of Nepal 2015 has introduced a three-tiered governance system: Federal, Provincial and Local Government. The rights and responsibilities of each tier has been defined, although this is still in the process of being established. Below is a list of selected legislation that are relevant, particularly to regulating and guiding activities within the area surrounding the Sacred Garden. For each of these, the latest amendment will need to be referred to.

- Local Governance Operation Act 2074 (2017)
- Environment Protection Act 2053 (1997)
- Soil and Watershed Conservations Act 2039 (1982)
- Building Act 2055 (2008)
- Town Development Act 2045 (1998)
- Forest Act 2049 (1993)
- Aquatic Animal Protection Act 2017 (1960)
- National Parks and Wild Life Conservation Act 2029 (1973)
- Tele Communication Act 2053 (1997)
- Nepal Electricity Authority Act 2041 (1984)
- Electricity Act 2049 (1992)
- Local Administration Act 2028 (1971)
- Environment Protection Act 2053 (1997)
- Tourism Act 1934 (1978)
- Industrial Enterprises Act 2048 (1992)
2.2.2 CONSERVATION AND DEVELOPMENT GUIDELINES
The Guidelines for the Physical Plan of the Sacred Garden of Lumbini was prepared in cooperation with all relevant authorities, stakeholders and experts.

PART A. Guidelines to protect the World Heritage property and its outstanding universal value

1 Safeguard the attributes that convey the OUV of the property
The Outstanding Universal Value of the property will be safeguarded, by managing the attributes that convey OUV and ensuring the authenticity and integrity of the property. Highest level of national and international protection will be provided for the World Heritage property.

2 Extent of World Heritage boundary
The existing World Heritage boundary is to be extended to cover the entire Inner Sacred Garden and all archaeological sites within the entire Sacred Garden area and planning will be carried out taking this into consideration.

3 Extent of buffer zone to World Heritage and its protection
The buffer zone to the World Heritage property is to be extended to encompass the entire Outer Sacred Garden and planning will be carried out taking this into consideration.

4 Protection through “Zones of Influence”
The “Zone of Influence” will be considered as the Lumbini Development Area of 5 x 5 mile as per the Lumbini Master Plan and this area will be planned and required legislation put in place to ensure appropriate development that does not impact the integrity of the World Heritage property in any manner such as the degradation of archaeological material through pollution.

5 Provisions for additional Nomination
Provisions will be made to allow for additional nominations of further Buddhist sites in the districts of Kapilbastu, Rupendehi and Nawalparasi (Bardaghat Susta West).

6 The site manager of the World Heritage property
The site manager will be the Lumbini Development Trust, with the specific responsibility to coordinate all affairs related to managing, monitoring and reporting on the World Heritage Property.

7 Heritage Impact Assessment
All development activities that are undertaken within the Sacred Garden area will have to pass a Heritage Impact Assessment.

PART B. Guidelines to address the Lumbini Master Plan

8 Consideration of the atmosphere in the Sacred Garden
The Sacred Garden is to have an atmosphere of tranquillity, universality and clarity.

9 Boundaries of Sacred Garden as defined in the Lumbini Master Plan
The Sacred Garden is to be defined as per the area indicated in the Lumbini Master Plan (1600 x 1360 meters)

10 Consideration of the provisions for roads within Inner Sacred Garden
The concept of an abstract grid system of access roads as per the Lumbini Master Plan can be considered in areas where there are clearly no potential archaeological sites, however with appropriate paving materials.

11 Consideration of the provisions for the archaeological site
The provisions defined in the Lumbini Master Plan for the archaeological site will be taken as the basis for all planning done within the Sacred Garden. However, no activities will be allowed that cause any kind of damage or affects the archaeological vestiges.
12 **Consideration of the approach to the Sacred Garden**
The main approach to the Sacred Garden for visitors will be from the north.

13 **Consideration of controlling flooding**
The planning of the Sacred Garden will ensure that flooding and ground water table is controlled to safeguard the archaeological vestiges.

14 **Consideration of existing and new structures within the Sacred Garden**
All planning in respect to existing structures and new structures within the Sacred Garden will follow the provisions in the Lumbini Master Plan, preceded by Heritage Impact Assessments, and ensuring the facilities are non-intrusive and reversible.

**PART C. Guidelines to ensure an appropriate and sustainable environment**

15 **Ensuring an appropriate natural setting within the Sacred Garden**
The natural setting within the Sacred Garden will take into account the spiritual context of the birthplace of Lord Buddha as a place of pilgrimage.

16 **Ensuring the protection of wildlife and their habitat around the Sacred Garden**
Wildlife and their natural habitat will be strictly protected in the Sacred Garden, in the Lumbini Master Plan area as well as the surrounding region.

17 **Ensuring appropriate plantations within the Sacred Garden**
The plantations within the Sacred Garden will be with indigenous species of plants, ensured that the plantations are not monocultures, and take into account the Archaeological Risk Maps as tree roots are very destructive to underlying archaeological deposits.

18 **Ensuring protection of river ecosystems around the Sacred Garden**
The river ecosystems of the Harhawa and Telar rivers that flow through the Sacred Garden will be protected in respect to water management and pollution right from their sources.

19 **Provisions for an integrated conservation approach for the region**
A regional conservation approach for natural and cultural resources will be established and implemented for the districts of Kapilbastu, Rupendehi and Nawalparasi (Bardaghat Susta West) involving national and international stakeholders.

20 **Ensuring pollution-free environment in and around the Sacred Garden**
Strong measures will be put in place to make the Sacred Garden a pollution-free zone and all polluting activities must be stopped within the Sacred Garden and it must be assured that the external polluting activities do not impact the Sacred Garden.

21 **Provisions for alternative energy sources**
To ensure a pollution free area, alternative energy sources will be prioritized, however ensuring that there is no adverse impact on the property which would also include any visual impact.

**PART D. Guidelines to conserve the archaeological vestiges**

22 **Safeguarding the testimony to the Birthplace of Lord Buddha**
The protection of the archaeological vestiges that are testimony to Lumbini being the birthplace of Lord Buddha and a site of pilgrimage that spans a period of over two millennia is non-negotiable.

23 **Standardization of the phases of development of Lumbini in antiquity**
The phases of development and linked historic periods are to be standardized to ensure a coherent understanding of the property for purposes of research, interpretation and presentation.

24 **Standardization of the categories of monuments at Lumbini**
The categories of monuments are to be standardized to ensure a coherent
understanding of the property for purposes of research, interpretation and presentation.  

25 Activities and interventions to be non-intrusive  
All activities and interventions within the Sacred Garden are to be non-intrusive to the archaeological vestiges.  

26 Activities and interventions to be reversible  
All activities and interventions within the Sacred Garden are to be reversible without causing any damage to the archaeological vestiges and the integrity of the site.  

27 Shelters for archaeological vestiges  
Shelters, whether permanent or temporary, will only be provided for the most significant archaeological vestiges and only if found to be essential for their long-term conservation and if developed in an appropriate manner.  

28 Archaeological vestiges to remain visible  
The exposed archaeological vestiges are to remain visible to visitors and provisions are to be made for any future archaeological structures to be kept exposed and visible for visitors as long as it does not compromise their long-term conservation.  

29 Clear and truthful interpretation to be provided for visitors  
The archaeological vestiges are to be presented to the visitors in a clear and truthful manner.  

30 Restriction of access onto the archaeological monuments  
Access onto all archaeological monuments will be restricted and clearly defined paths and areas will be provided for the visitors and pilgrims.  

31 Provisions for worship, offerings and meditation  
Provisions are to be made for worship, offerings and mediation which fulfills the requirements of the pilgrims however ensuring the protection of the archaeological vestiges.  

32 Quality and the use of appropriate materials within the Sacred Garden  
Any new construction that takes place within the Sacred Garden will be carried out ensuring good quality and using appropriate materials - with the exception of stone – however these materials must clearly be distinguishable from the archaeological structures.  

PART E. Guidelines to provide facilities and services for visitors / pilgrims  

33 Provisions for visitor/ pilgrim facilities and services within the Inner Sacred Garden  
Facilities and services will be provided within the Inner Sacred Garden for the visitor’s general requirements that however do not compromise on the sacred atmosphere, harmony, beauty and authenticity of the site and on safeguarding the archaeological vestiges. All such facilities and services must be non-intrusive and reversible.  

34 Removal of inappropriate visitor / pilgrim facilities within the Inner Sacred Garden  
Existing facilities that are inappropriate for the Inner Sacred Garden will be removed or relocated to a suitable location. All rubble will be carefully and manually removed from the entire Sacred Garden area. These would be facilities that are not in harmony and not compatible to the natural, historic, religious and archaeological setting.  

35 Provisions for visitor / pilgrim facilities and services within the Outer Sacred Garden  
Facilities and services will be provided within the Outer Sacred Garden for the visitor’s general requirements that however do not compromise on the harmony of the natural setting and ensure a pollution-free environment. Appropriate waste disposal will be ensured.  

36 Removal of inappropriate visitor facilities within the Outer Sacred Garden  
Existing facilities that are inappropriate for the Outer Sacred Garden will be removed or
relocated to a suitable location. All rubble will be removed carefully and manually from the entire Sacred Garden.

37 Provisions for visitor services outside the Sacred Garden
Visitor facilities and services where possible will be provided outside the Sacred Garden.

PART F. Guidelines to regulate activities within the Sacred Garden

38 Provisions for appropriate activities in the Inner Sacred Garden
Provisions will be made to allow for appropriate activities in the Inner Sacred Garden nevertheless ensuring the sanctity, harmony and purity of the site. Appropriate activities could be considered those that are very essential for the performance of religious practices, for the preservation and presentation of archaeological vestiges, for the circulation of visitors and pilgrims and for protection and security measures.

39 Controlling of inappropriate activities within the Inner Sacred Garden
Provisions will be made to control inappropriate activities in the Inner Sacred Garden to ensure the peace, cleanliness and harmony of the natural environment. Inappropriate activities could be considered those that threaten the tranquillity, sanctity and authenticity of the site.

40 Provisions for appropriate activities in the Outer Sacred Garden
Provisions will be made to allow for appropriate activities in the Outer Sacred Garden to enhance the experience of the natural environment and to reduce the visitor pressure on the Inner Sacred Garden. Appropriate activities could be considered those that are very essential for the performance of religious practices, for the presentation of archaeological vestiges, for the circulation of visitors and for protection and security measures.

41 Controlling of inappropriate activities within the Outer Sacred Garden
Provisions will be made to control inappropriate activities in the Outer Sacred Garden to ensure the peace, cleanliness and harmony of the natural environment. Inappropriate activities could be considered those that threaten the tranquillity, sanctity and authenticity of the site.

42 Balance pilgrim activities and archaeological conservation
All decisions will be taken based on the understanding for the need to balance the activities of the pilgrims with the need to conserve and protect the archaeological vestiges of the site.

PART G. Guidelines to control inappropriate development

43 Control inappropriate development within the Sacred Garden
No development works will be carried out within the entire Sacred Garden other than what is absolutely necessary to conserve the property and provide basic facilities for the visitors/pilgrims, however such activities must be preceded by a Heritage Impact Assessment, while being non-intrusive and with a detailed plan for reversibility. Tree plantations will be carefully planned and only carried out after ensuring that archaeology is not impacted.

PART H. Guidelines to promote continued research and discourse

44 Developing Lumbini as a Centre for Buddhist Studies
Lumbini will be promoted as a Centre for Buddhist Studies.

45 Developing Lumbini as the Global Centre for Conservation Ethics
A Global Centre for Conservation Ethics is to be established to expose and help internalize conservation ethics that is needed to heal and care for the earth.
46 Promote research on the archaeological sites in the region
Research on the archaeological sites in the region spanning from Nawalparasi (Bardaghat Susta West) to Kapilbastu districts will be promoted to gain better understanding on the region’s ancient history and their linkages to Lumbini.

47 Research on potential archaeological sites in the Sacred Garden
Research on identifying, evaluating and interpreting the physical signature of Lumbini and associated sites will be implemented to allow for better presentation, management and long-term protection.

48 Identification of issues and challenges facing archaeological conservation
The long-term issues and challenges facing archaeological conservation must be identified and appropriate responses found based on the most advanced knowledge and technology.

49 Establishment of Consultation processes
Processes will be put in place to ensure the cooperation and collaboration of all stakeholders in partaking in an appropriate development of the region to ensure the safeguarding of the cultural, natural and spiritual heritage in and around Lumbini.

50 Establishment of Documentation Centre
A documentation centre will be established for all forms of documentation on the cultural and natural heritage of the Greater Lumbini Area spanning from Nawalparasi (Bardaghat Susta West) to Kapilbastu.
2.2.3 ADDITIONAL TOOLS AND PROVISIONS

Various management tools have been established or are in the process of being established. These are important means of implementing and enforcing the legal provisions and are considered part of the legal framework package. These will be used within the overall management system; this means the institutional, legal and the resources frameworks.

Heritage Impact Assessments (HIA)
A process for Heritage Impact Assessment has been legally established. The implementation of Heritage Impact Assessments (HIA) will be a strategic means of ensuring that development and conservation activities in and around heritage properties are compatible and appropriate. This will require the LDT to test their projects in respect to their impact on heritage, and once accepted, provide the means of appropriate implementation. The HIA wherever required will be carried out based on the standardized procedures.

Archaeological Risk Map (ARM)
The archaeological risk maps define which areas have subsurface archaeology, which areas do have subsurface archaeology and which areas don’t have subsurface archaeology. The map will become part of the legal system for protecting sub-surface archaeology. This will also be the basis for decision making in respect to any infrastructure or development works that might be required. This, however, does not replace the need for HIAs.

Data Management System
Effective management requires easy access to information which is regularly updated. The information collected through regular monitoring will be feed into a data management system, allowing site managers to obtain accurate information. The data management systems will link inventories, mapping and assessments to the map while additionally linking this to management activities such as monitoring and activity reports. The data management system would include a GIS.

Inventories of Significant Attributes
Inventories will include both tangible and intangible attributes of the heritage property. The assessments carried out by LDT and DOA assisted by various organizations and experts will be linked to the information of the individual attributes as compiled in the data management system. The inventories will be constantly updated and close cooperation will be maintained to ensure that the inventory is used as a management tool.

Training Programmes
To ensure that there is sufficient capacity to implement the management system correctly, regular training programmes are required. Such activities will to be carried out targeted specifically to requirements directly related to safeguarding heritage, but also in respect to overall management. All staff of LDT and DOA must have basic training in heritage conservation, and only the relevant conservation officers will take decisions and supervise work within the heritage property.

‘One Plan’ Coordination
The planning of all relevant government authorities will be harmonized, particularly within the areas around heritage sites. This is particularly relevant for the municipal planning within the ‘zone of influence’ of five-by-five miles around the Lumbini Sacred Gardens. This will allow for information to be shared and planning and decision-making to be done in a coordinated manner.

National Building Code and Quality
The provisions of the National Building Code will be implemented within the Planning Area. This is particularly relevant in respect to quality of materials and workmanship of all works carried out in and around the Sacred Garden.
The Government of Nepal will ascertain the resources required to administer the World Heritage property and to ensure the proper conservation and maintenance of the facilities in the Sacred Garden. Resources for research, training and improvement of facilities within the Sacred Garden can be augmented through international partnerships and funding agencies.

The State Party shall ensure the required resources for the management of the Kathmandu Valley World Heritage property. Resources required for managing Kathmandu Valley World Heritage property have been identified under three sections:

1. Human Resources
2. Financial Resources
3. Material and Equipment Resources

These resources need to be considered not as separate entities, but as part of a comprehensive package. For each of these resources the typology, source and general scale of will be defined. Detailed requirements would however need to be assessed in the Annual Action Plans linking it to the planned actions.

Resources are required for various categories of actions to address identified issues. For the management of the cultural heritage site resources are required to carry out:

1. Routine Actions
2. Time-bound Interventions
3. Emergency Response

Each category of action would require different types of human resources, financial resources and material and equipment resources.

Resources are required for the integrated management and coordination along with the implementation of the sector plans. Therefore, activities can be categorized under the following heading:

1. Integrated Management
2. Conservation
3. Sustainable Development
4. Disaster Risk Management
5. Tourism Management

The management of these different attributes will require differing resources both in typology as in scale.

The planning of required resources will be given high priority, directly related to all management issues that need to be addressed and the related actions that need to be carried out. For each action, the required human and financial resources will be identified so that prioritization and implementation planning can be carried out in a realistic manner. In addition to the direct resource needs and use, the indirect implications on sustainable development of the heritage property will be considered. This requires an in-depth consideration of the socio-economic implications of all activities that are carried out within the heritage property.

The following sub-sections will define the various types of resources and what they will be required for within the management system for Lumbini, the Birthplace of the Lord Buddha, World Heritage property.
2.3.1 HUMAN RESOURCES

Human resources for management of a cultural heritage site consist of people with the required knowledge and skills to maintain and safeguard the significant attributes. Human resources incorporate the managers and planners as well as those responsible for carrying out skilled or non-skilled activities on the site, their availability, motivation, training and remuneration.

Required Human Resources:

For **routine actions** and the general management of the heritage site managers will be provided, who can monitor the property, do reporting, carry out necessary procedures for guiding development, as well as managing the museum and database. The managers at the cultural heritage site must understand the legal and technical aspects of safeguarding heritage. Particular importance needs to be given to the required experts for maintaining the site, archaeology and cultural objects, as well as intangible heritage.

For **time-bound interventions** which includes the preparation, planning, design, monitoring and auditing of projects, required expertise will be made available to ensure successful, efficient project are carried out. The experts, artisans, contractors, labour must understand the legal and technical aspects of safeguarding heritage. The projects that are carried out, particularly in respect to conservation works and related research must have the best trained and experienced experts with the specific expertise in the tasks that they are to perform. For development projects there must be experts involved who have knowledge of working within a cultural heritage site.

For **emergency preparedness and response**, trainers and responders will be ensured, both at local as well as national level, who are adept with the conditions and requirements of a heritage property and are trained in dealing with cultural landscapes, archaeology and cultural artefacts. All forms of hazards, whether natural or human induced, will be considered in the preparedness and response procedures.

**Awareness and general understanding of cultural heritage:** The managers and decision-makers shall be provided training and awareness on conservation management procedures and requirements for the heritage property to ensure that all decisions and actions are appropriate and compatible to the relevant legal provisions as defined in the IMF document.

**Collaboration and Monitoring:** The management of the heritage property requires the close collaboration of the site manager and all the departments of the local and provincial government as well as line agencies to ensure coordination. Collaboration will allow for efficient use of the available human resources.

**Securing Human Resources:**

- **Local:** Local expertise will be used particularly in respect to monitoring the site, and activities requiring local knowledge. This will be an opportunity for local community to get involved in assisting in managing the cultural heritage site.

- **National:** national expertise will be represented within advisory committees to allow for regular involvement in the management of the heritage property. This would include members of educational institutions and professional associations.

- **International:** International expertise will be kept on a roster to allow for support whenever required. This would be closely linked to ongoing research and support for project design and implementation.

Government officers and staff in the various relevant departments who will be responsible for the respective sectors and category of actions. Training will be coordinated with respective responsibilities.
2.3.2 FINANCIAL RESOURCES

Financial resources for management of a cultural heritage site consist of different forms of funding required for maintaining and safeguarding the significant attributes.

The planning of the areas surrounding the Sacred Garden, especially within the Master Plan area needs bylaws which are strictly enforced with the help of subsidies, incentives and where necessary fines. Funds must be made available for possible expropriation of property in critical locations.

The sustainable conservation and protection of the heritage sites and archaeological vestiges is closely linked to the economic development of the region. The socio-economic development of the local community must be a priority in regional development plans.

Administrative Expenses
The Lumbini Development Trust will ascertain the funds required to cover administrative costs for the implementation of the Integrated Management Process. This would include the funds required for the management of the Lumbini World Heritage Property to carry out their full spectrum of responsibilities as defined in section 2.2.1 of this document. The Government of Nepal will also provide the funds required by the Department of Archaeology to carry out their responsibilities in Lumbini under the Ancient Monument Preservation Act.

Conservation and Maintenance Funds
The Government of Nepal will ensure sufficient funds for proper protection of the archaeological vestiges and the maintenance of the facilities within the Sacred Garden. This includes the continued archaeological research and where required conservation of the archaeological vestiges. Furthermore, the forested area of the surrounding Sacred Garden will be established and maintained.

Improvement of Facilities, Research and Training
Funds required for research, training and improvement of the facilities within the Sacred Garden can be augmented through international partnerships and funding agencies. There should however be strict control over the activities to ensure that these do not have a negative impact on the World Heritage property.

Planning within the Municipal Area
The planning of the municipal area will be carried out using legal instruments augmented by the use of subsidies and incentives. These will to be closely linked to the taxation and fees that are to be imposed on planning areas. The financial involvement of the community is essential for the sustainability of conservation projects; however, this will be closely linked to incentives provided and facilitated by the government (tax reductions, grants and soft loans). A means of providing incentives will be free technical assistance.

The local economy in and around most Monument Zones is geared towards Tourism. This means that the entire economy particularly of the local community will be affected. A high priority will be given to improving the livelihood of local community members by providing support and incentives towards their traditional activities local manufacturing and production. Financial support for communities to maintain or building as per the style of traditional buildings will be arranged.

Planning the Greater Lumbini Area
The sustainable development of the Greater Lumbini Area will depend on the socio-economic development of the local community. The surrounding communities must see a benefit from conserving the heritage sites. This clear link needs to be created between the conservation of the archaeological vestiges in the region and the economic possibilities for the local community.
2.3.3 MATERIAL RESOURCES

Material and equipment resources for management of a cultural heritage site consist of required appropriate materials and specialized equipment to maintain and safeguard the significant attributes.

Material for the conservation of monuments and their ornamentation will be provided for which would include both traditional as well as highly specialized materials. In a similar manner basic equipment will be required for the management of the cultural heritage site, however highly specialized equipment would be necessary to carry out extensive survey as well as minutely detailed investigations.

Required Material and Equipment Resources

Material and equipment resources for routine actions will be provided to ensure that monitoring and maintenance of the cultural heritage site is possible. This means the basic requirements of transportation, communications and documentation will be provided. Additionally, the material and equipment required for maintaining, cleaning and safeguarding the main attributes of the property will be provided. These requirements will be provided through the regular annual budget.

Material and equipment resources for time bound interventions will generally be linked to the particular projects. This means the material and equipment necessary for the particular time-bound intervention will be arranged for by those responsible for implementation. There is, however, certain material that are regularly required particularly for very specific tasks in conservation that might best be arranged by the government through developing specific suppliers or establishing stores. This is also the case for equipment particularly those required for regular recurring projects such as in conservation or archaeological investigations.

Material and equipment resources for emergency response will need to be stored and made available when required. These materials and equipment will be part of the disaster risk management planning. Certain basic equipment will be stored at site along with materials required for immediate response. A larger source of materials and equipment for emergency response needs to be accessible when required from provincial or national level.

Securing sufficient Material and Equipment Resources

Government will acquire equipment that is necessary to carry out monitoring, assessments and surveys. This will go along with establishing well equipped conservation labs. A detailed inventory of such equipment will be made as required for work in the archaeological sites. The inventory will determine whether the equipment would be used regularly and would therefore need to be acquired. Depending on the expense, such equipment could be provided at either site level or national level. Furthermore, equipment that is expensive and not regularly used can be leased or integrated into projects to be carried out by international partners who will provide the necessary equipment or the use of such equipment in the respective locations.
3. IMPLEMENTATION

3.1 INSTITUTIONALISATION

As party to the World Heritage Convention, the Government of Nepal is obliged to ensure the long-term safeguarding of the values of their World Heritage properties. As per article 108 of the Operational Guidelines for the Implementation of the World Heritage Convention, “Each nominated property should have an appropriate management plan or other documented management system which must specify how the Outstanding Universal Value of a property should be preserved, preferably through participatory means.”

The implementation of the Integrated Management is an ongoing process that requires regular review, amendment and detailing of action plans. It is therefore necessary to institutionalize this process and guarantee its continuation. This requires the State Party to establish the necessary institutional, legal and economic frame work for the implementation of the Integrated Management Process.

3.1.1 ESTABLISHMENT OF FRAMEWORKS

Through the adoption of the Integrated Management Framework for Lumbini, the Birthplace of the Lord Buddha World Heritage property, it is understood that the Government of Nepal has in principle adopted the institutional, legal and economic frameworks as defined in this document. The Government of Nepal will carry out the necessary procedures to legally establish these frameworks and ensure their continuity as per the conditions laid down in this document.

3.1.2 ESTABLISHMENT OF PROCESSES

For the Sacred Garden
To ensure an efficient and effective management of the heritage property, it is necessary to clearly define all essential management processes. These would include but not restrict themselves to the following procedures for decision-making and implementation within the Sacred Garden:
- for any kind of construction work
- for any kind of archaeological work
- for any kind of conservation work
- for visitor management
- for providing services
- for monitoring
- for maintenance

These processes need to be strictly adhered to by the Site Manager and related authorities. Each step in the process would need to identify who carries out what action, what information is passed on, why it is necessary and how long it would take.

For areas around the Sacred Garden
Clear processes need to be defined to control development in the areas surrounding the Sacred Garden, to ensure that the outstanding universal value of the World Heritage property is safeguarded. These would include but not restrict themselves to the following procedures for decision-making and implementation in the areas surrounding the Sacred Garden:
- for controlling pollution
- for controlling tall buildings
- for controlling traffic
- for controlling flooding

Further processes would be required once an appropriate mechanism is established to ensure the sustainable development of the surrounding region stretching across the three districts of Kapilbastu, Rupendehi and Nawalparasi (Bardaghat Susta West).
3.1.3 PLAN OF ACTION

The Plan of Action is a formulation of specific tasks that need to be accomplished to achieve the Key Objectives of the Integrated Management Process. These tasks or actions are planned taking into account the implementing authority, the time scale and funding sources.

The Integrated Plan of Action is a component of the Integrated Management Process for Lumbini, the Birthplace of the Lord Buddha. The Integrated Plan of Action is to be taken as the working document for strategic planning to implement the Integrated Management Process.

The Integrated Plan of Action is comprised of a compilation of issues and key objectives for the integrated management of the Sacred Garden and the World Heritage property of Lumbini. Based on the key objectives, an overall Plan of Action considering short, medium and long-term activities is formulated. For each of the specific actions lead agency, time scale and funding would need to be identified. The actions must take into account all the provisions of the Conservation and Development Guidelines.

Management Issued
- Compilation of lists of issues from various sources

Key Management Objectives
- The objectives of the management system required to respond to the identified issues

Actions
- To required actions to address issues and fulfill management objectives
- For each Action the following parameters are to be identified: lead agency, time scale, funding

This document would need to be reviewed and revised annually and should be the basis for strategic planning for the integrated management of the Sacred Garden, as well as the linked heritage sites in the surrounding Greater Lumbini Area.

3.1.4 ANNUAL ACTION PLAN

The Annual Action Plan is prepared to correspond the Nepali Fiscal Year, which begins mid-July. The Annual Action Plan formulates all the activities that have been planned out in detail for the heritage site during the respective 12-month period.

The Annual Action Plan must be seen as a planning tool and not merely as an annual financial proposal. The preparation of the Annual Action Plan must begin 3 months before the beginning of the following fiscal year. The progress of the previous Annual Action Plan must be assessed, the Plan of Action reviewed and the next Annual Action Plan prepared. The Annual Action Plan will be prepared by Lumbini Development Trust in close collaboration with the Department of Archaeology.

Each of the Actions must be clearly defined in respect to:
- the reason for prioritization;
- the implementation process;
- the projected outcome;
- the financial resources;
- the timeframe;
- the implementing agency;

The individual prioritized actions for the following Annual Action Plan would be based on the revised Plan of Action, which provides a holistic view of all the required actions to achieve the key objectives of the Integrated Management Process. The actions for which financing is available, are then included in the Annual Action Plan.

The Annual Action Plan may also include actions that have been placed under high priority, as critical actions, for which financing has not yet been arranged. For these actions, a strategy must be prepared for fund raising through potential partners.

The Annual Action Plan must also provide for emergency actions, which would only be determined during the course of the year.
3.2 SECTOR STRATEGIES

The sector strategies are an integral part of the Integrated Management Framework. Strategies will be developed to deal with as a cross-cutting issues within the World Heritage property, the buffer zone and the surrounding areas.

The implementation of the Integrated Management Process requires the ongoing coordination of various sector strategies: archaeology, local development, disaster risk management, visitor management and Buddhist organisations.

3.2.1 STRATEGY FOR ARCHAEOLOGY

A Strategy for Archaeology is to be prepared as an integral part of the Integrated Management Framework. Starting from the position that the protection of the archaeological vestiges that are testimony to Lumbini being the birthplace of Lord Buddha and a site of pilgrimage that spans a period of over two millennia is non-negotiable, the strategy for archaeology should be focused on the following prioritised activities:

- Research into the standardization of the phases of development of Lumbini in antiquity to ensure a coherent understanding of the property for purposes of research, interpretation and presentation.
- Research into the standardization of the categories of monuments at Lumbini to ensure a coherent understanding of the property for purposes of research, interpretation and presentation.
- Research into the long-term issues and challenges facing archaeological conservation to identify appropriate responses based on the most advanced knowledge and technology.
- Research, study, publication and exhibition of material excavated at Lumbini by the Japanese Buddhist Federation and Department of Archaeology, Government of Nepal;
- Research, study, publication and exhibition of material excavated at Lumbini by the Japanese-Funds-in-Trust-for-UNESCO, Lumbini Development Trust and Department of Archaeology, Government of Nepal;
- Research, study and publication of the results of archaeological watching briefs to accompany any approved HIAs within the Sacred Garden;
- Design research investigations to identify, evaluate and interpret the potential presence of an Early Historic pottery workshop at the Helipad;
- Design research investigations to identify, evaluate and interpret the later structures of the Village Mound;
- Design research investigations to accompany the reversal of the 2002 Mayadevi Temple and/or associated improvements to drainage and conservation;
- Wider survey and assessment of the 3x1 mile area to identify further possible areas of archaeological significance.
- Design research investigations to better conserve, protect and present the Nursery Well

3.2.2 LOCAL DEVELOPMENT STRATEGY

A Local Development Strategy is to be prepared as an integral part of the Integrated Management Framework. The Local Development sector will contribute to the sustainable development in and around the heritage area. The Local Development Sector is critical for the sustainable development of the Greater Lumbini Area.

Development of this region will be based on the conservation of the heritage within the region, especially the numerous archaeological sites that are testimony to a history spanning over two and a half millennia. All development activities that are carried out will ensure that it does not lead to any negative impact on the heritage. This would include development activities linked to for example infrastructure, agriculture and industry.
The Local Development Strategy will include regional and urban planning dealing with settlement, land-use, infrastructure development and environment. Community engagement and livelihood will deal with the sustainability of the communities living in and around the heritage sites and how they participate in cultural activities. The strategy for environmental sustainability will deal with both the need to protect the landscape, as well as address issues of pollution and waste management. The Local Development Strategy encompasses infrastructure and services such as: roads and traffic, water supply, solid waste management, sewage management, electricity supply, telecommunications, formal and non-formal education and environment management.

3.2.3 DISASTER RISK MANAGEMENT STRATEGY

A Disaster Risk Management Strategy is to be prepared as an integral part of the Integrated Management Framework. As per paragraph 118 of the Operational Guidelines for the implementation of the World Heritage Convention, "The Committee recommends that States Parties include risk preparedness as an element in their World Heritage site management plans and training strategies".

We understand that disasters are created through the combination of hazards and the vulnerability of a given site or structure. We have come to understand that possibly even the characteristics of the hazards might be changing, for example due to climate change. The vulnerability of our environment in many cases has increased drastically due to growing populations and the uncontrolled spread of human habitat and construction with little consideration for risk reduction. There is much that can be learnt from heritage to reduce disaster risk; however, these lessons need to be introduced into the mainstream planning and decision making.

The potential hazards that this area is subjected to would be mainly earthquakes, fires and flooding. Accordingly, the Disaster Risk Management Strategy is to be prepared, that the vulnerability of the property will be constantly monitored and measures will be taken to ensure risk reduction. This will be coordinated with the overall disaster risk management plans at local, district and national levels.

3.2.4 VISITOR MANAGEMENT STRATEGY

A Visitor Management Strategy is to be prepared as an integral part of the Integrated Management Framework. For Lumbini, as a major site of pilgrimage, the Visitor Management Strategy is essential to ensure safety, security and allow the visitor to fulfil their purpose for visiting this sacred site. Visitor management plays a major role in heritage conservation, both as a source of income as well as to gain acknowledgement for the heritage.

Without appropriate management, visitors, can have a negative impact on the property. The Visitor Management Strategy must address the issues of heritage conservation. In respect to the actions that might impact the outstanding universal value of the World Heritage property of Lumbini, the Integrated Management Plan must be given priority over other plans and programmes.

The Visitor Management Strategy will ensure that visitor development goes hand in hand with heritage conservation, while ensuring that the community can profit from this potential source of income. Tourism development will assist in preserving the outstanding universal value of the World Heritage areas. The activities carried out by the Tourism sector will respect the authenticity and integrity of the World Heritage property. The tourism sector will ensure that their activities do not contribute to development that has an adverse effect on the heritage property.
3.2.5 STRATEGY FOR BUDDHIST ORGANISATIONS

A Strategy for Buddhist Organisations is to be prepared as an integral part of the Integrated Management Framework. Considering the importance of Lumbini for all Buddhist Communities throughout the world, their contribution to the conservation and safeguarding of this World Heritage property is accepted, and would therefore need to be facilitated. Coordination will be developed with local CBOs and NGOs that have a stake in the conservation and development of Lumbini and the related heritage sites in the region.

3.3 MONITORING, REPORTING AND REVIEW

The implementation of the Integrated Management Process is to be considered in five-year cycles. The first Five-Year Schedule will begin mid-July 2022 and end mid-July 2027. After every five years, a thorough review of the Integrated Management Process is to be undertaken, allowing necessary amendments to be made.

On a yearly basis, work will be implemented as per the Annual Action Plan. The year is based on the Nepali Fiscal Year. During the last three months of each fiscal year, the Plan of Action is to be reviewed and the next Annual Action Plan prepared.

Reporting processes will be established for monitoring the implementation of the Annual Action Plan on a monthly basis and to review the weekly site monitoring reports of the Lumbini Development Trust.

Site Monitoring and Reporting
Weekly Site Monitoring will be carried out by the Lumbini World Heritage Site Management Office by filling out a monitoring form. This form must be filled out regularly, stating whether activities have taken place or not, whereby a detailed history of the site is documented.

Monthly reporting will be done by the Lumbini Development Trust as per the finalized reporting processes. Information will be presented as notification or for necessary decisions.

Emergency reporting will be done by the Lumbini Development Trust as per the finalized reporting processes and an emergency response plan.

Annual Progress Reports will be prepared in conjunction with the implementation of the Annual Action Plans. The progress report will explain whether targets have been achieved based on the predetermined indicators. The indicators in most cases would be a document or legislation that has been acknowledged or passed by the concerned authorities, implementation of certain provisions, completion of certain specific actions or establishment of an institution, body or programme.

Periodic Assessment
Periodic Assessment will be carried out by the Lumbini Development Trust on the implementation of the Integrated Management Process and the state of conservation of the Monument Zones.

Monthly Assessment of ongoing activities will be done as per the finalized reporting processes. This will be based on the reports prepared by the Lumbini Development Trust. The monthly assessment will also include a progress report on implementation of the Annual Action Plan.

Annual Assessment of implementation of the Action Plan will be done in conjunction to preparation of the next annual Action Plan. The overall Plan of Action will also be reviewed and revised as found necessary.

Five-Year Assessment of all the components of the Integrated Management Process will be carried out. The Integrated Management Framework, including the institutional, the legal and the economic frameworks will be reviewed and if necessary amended.
HERITAGE IMPACT ASSESSMENT (HIA)
IN NEPAL
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- Standard format- HIA F-8 2021: Certificate of compliance from DOA to Actor
1. Executive Summary and Introduction

Heritage Impact Assessment (HIA) is a strategic means of ensuring that development and conservation activities in and around heritage properties do not cause an unacceptable degree of negatively impact. For HIA to be an effective tool, it has legal justification and is integrated in official procedures. This document provides an overview of how HIA is carried out as an officially established procedure in Nepal. The required formats and procedures for carrying out HIA has been provided.

Justification

There are no standard procedures for assessing the impact of development and conservation works on cultural heritage. Previously, this task was dealt with by a component of an Environmental Impact Assessment (EIA). This was not satisfactory particularly since the EIA procedure was not linked to the governance system for cultural heritage. To address this disparity HIA has been promoted particularly by the World Heritage Committee and the advisory bodies ICOMOS and ICCROM. The HIA procedure has been established not only to cater to World Heritage, but also to be used as standard procedure for all identified cultural heritage sites.

Legislation

HIA is in the process of being embedded in the legislation of the Department of Archaeology. The draft of the sixth amendment of the Ancient Monument Preservation Act (AMPA 1956), has included provisions for HIA. The Act will only mention the establishment of HIA, leaving the details to be formulated separately. This gives the Department of Archaeology the authority to demand HIA wherever found necessary and defined by respective regulations.

Procedures and components

The HIA procedure has been clearly defined within a set of regulations adopted by the Department of Archaeology. The regulations identifies under what circumstances HIA will be applied, as well as defining the format and process of implementation. This is linked to a system of monitoring to ensure that the agreed provisions are followed. The entire Heritage Impact Assessments process has three main components, which are (1) defining the need for the HIA, (2) carrying out the HIA and (3) monitoring and enforcing the HIA.

Objectives

The HIA procedure has been established with the following objectives to safeguard cultural heritage in the broad categories of heritage sites, monuments, historic buildings and cultural objects:

1. To provide a permit system to control impact of proposed projects and activities on heritage.
2. To mitigate the impact of past or ongoing projects or activities through assessments and recommendations for rectification.
3. To plan measures to control risk of future projects or activities that could potentially impact heritage.
Involved parties

The involved parties in the HIA process include:

**Actor**
the person or legal body that carries out actions that could impact heritage

**DOA**
Department of Archaeology (Focal Authority) under the Ministry of Culture, Tourism and Civil Aviation. The DOA will be represented by the HIA Committee chaired by the Director General.

**Consultant**
professional with adequate experience and training to carry out HIA to be listed in a roster prepared by DOA

**Advisory Body**
a body of experts to advise the authorities on HIA to be decided by the Department of Archaeology. For issues concerning the World Heritage properties, ICOMOS Nepal is the suitable expert body.

Separation will be guaranteed between those intending to carry out a certain action which might impact heritage and those assessing the possible impact. The coordination will be done by the Department of Archaeology as the official focal point and authority for the process.

Within the Department of Archaeology, a HIA Committee has been established, chaired by the Director General and with representation of each section within the DOA. The HIA Committee of DOA is the official authority taking the final decisions based on the recommendations of the HIA consultants and the advisory body.

**Note for Emergency HIA**

The Department of Archaeology will arrange an annual budget for the implementation of Emergency HIAs.
2. Defining the need for HIA (Component 1)

The HIA process provides a tool to facilitate communications between heritage protection efforts and development activities. It provides a clear procedure to identify and analyse the potential impacts of human-induced threats on cultural heritage. This also links to finding compatible means for sustainable development to go hand-in-hand with heritage conservation.

**HIA for mitigation, response and planning**

HIA can be used as a tool for mitigation measures, for response measures or for planning measures. Depending on circumstances, either one of these justifications can be used to require a HIA to be carried out.

1. To provide a permit system to control impact of proposed projects and activities on heritage *(mitigation measures).*
2. To mitigate the impact of past or ongoing projects or activities through assessments and recommendations for rectification *(response measure).*
3. To plan measures to control risk of future projects or activities that could potentially impact heritage *(planning measures).*

**HIA for various categories of heritage**

The HIA procedure has been established as a tool to safeguard heritage in the broad categories of heritage sites, built structures and cultural objects. Furthermore, these categories can be also extended to the natural context and the associated intangible heritage. Should any activity threaten the value, authenticity or integrity of the heritage, a HIA can be considered necessary to find a means of halting or adapting the activities to bring the impact to an acceptable level.

<table>
<thead>
<tr>
<th>Heritage Site</th>
<th>Built Structures</th>
<th>Cultural Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Context</td>
<td>Intangible Heritage</td>
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</table>

**Initiation of HIA Process**

The HIA process can only be initiated through the decision of the HIA Committee of the Department of Archaeology, and it is up to this HIA Committee to take the final decision on whether or not to have an HIA prepared. However, the HIA Committee can be informed on planned activities or ongoing activities that might impact heritage.

1. HIA can be requested by the **Actor**, whether a private person, institution, government agency or international organization, in respect to planned activity in or around heritage that might be affected through their actions.

2. HIA can be based on information provided by **any person** with sufficient justification of planned or ongoing activities that might impact or might be impacting heritage.

3. HIA can be required by the **courts** for any legal case in respect to the protection of heritage, particularly related to private or community heritage.
3. Process for carrying out HIA (Component 2)

Once the need for HIA has been identified, a clear process will be followed which is integrated into the system of governance and justified by legislation. During the process of carrying out the HIA, a full moratorium will be enforced on any activities linked to the given case. Such notification will be made to the Actor when requesting for detailed information on the planned or ongoing activities.

For the preparation of a Heritage Impact Assessment the following processes will be required.

Required processes:
- Process for Submitting the Detail Project Report for the HIA
- Process for Selection of Consultant by DOA
- Process of preparation and review of HIA
- Recourse process for Actors
3.1 Process for Submitting Detail Project Report and request letter for HIA

Once the need of the HIA is decided, the Department of Archaeology notifies the Actor. The actor then submits detailed project reports and the Department of Archaeology assesses the project / activity based on indicators. The Actors then needs to pay the relevant fees for carrying out the HIA. This then becomes the basis for selection of Consultants by DOA.

### NEED FOR HIA DECIDED

(Component 1)

The “Actor” is notified of the need for HIA and is requested to submit detailed project reports along with a request for HIA.

3.1.1 Detailed Project Report (DPR)

The report shall include all relevant information required to assess the impact of the project on the heritage. This would mean include the following considerations:

(i) **The report shall have detailed explanations of all project components and activities** to allow for heritage to be safeguarded as per the three objectives of the HIA procedure. The detailed report shall provide all legal justification such as land ownership papers and other permissions.

(ii) **Activities linked to direct impact**: All project activities and project components need to be identified and documented, especially those that have direct impact on heritage. These could have physical impact, but could also have social, economic, chemical or other categories of impact on heritage.

(iii) **Activities linked to indirect impact**: All project activities and project components that could lead to indirect impact on heritage need to be identified and documented. These could be linked to activities that are indirectly generated out of the primary activities that would have impact later on.

(iv) **Activities linked to impact over time**: All project activities and project components shall be documented that would take place during preparation, implementation or during future operations.

(v) **Activities linked to impact over location**: All activities and project components would need to be provided with reference to their exact location relevant to the heritage.
3.1.2 Request Letter

The actor shall submit with the Detailed Project Report a request letter addressed to the Department of Archaeology. The letter shall follow the format with the contents as defined below.

(i) Addressed to Director General, Department of Archaeology
(ii) Subject of the letter shall be “Request for Heritage Impact Assessment for (Project / Activity Title)”.
(iii) Short description of and reason for project / activity
(iv) Request statement for HIA
(v) Agreement to pay standard expenses for getting HIA done
(vi) Agreement to follow standard procedures for HIA
(vii) Signature of authorized person with certification

Standard format - HIA F-1 2021: Draft Letter from Actor to DOA
HIA F-1 2021
Draft Letter from Actor to DOA
Please remove highlighted instructions and insert relevant information

[LETTERHEAD]

Director General,
Department of Archaeology,
Ramshahpath,
Kathmandu, Nepal

Date: dd/mm/yyyy

Subject: Request for Heritage Impact Assessment

Dear Director General,

I/We, [legal entity or person] are planning on carrying out a project/activity [title of project/activity] which could impact the heritage site of [name and detailed location of heritage site/monument/object]. This is located at [°'."N, °'."E].

The project Detailed Project Report (DPR) has been submitted along with this letter. The DPR includes detailed explanations of all project components and activities, activities linked to direct and indirect impact on heritage, and activities linked to long-term impact, along with indication of physical extent of impact.

I/We request the Department of Archaeology (DOA) to get a Heritage Impact Assessment (HIA) prepared for the project. I/We agree to cover standard expenses for the HIA, calculated as per DOA standards. I/We agree to accept the outcome of the HIA.

Thanking you,
Yours sincerely,

[Signature]

[Name of authorized person] [stamp]

Attached:
1. Project DPR
2. Certification letter of authorized signature
3.2 Process for Selection of Consultant by DOA

As per the overall process the Actor submits detailed project reports and the Department of Archaeology assesses the project / activity based on indicators. The Actors then need to pay the indicated fees for carrying out the HIA. This then becomes the basis for selection of Consultants by DOA.

| The “Actor” is notified of the need for HIA and is requested to submit detailed project reports along with a request for HIA. |
| “DOA” assesses the size and complexity of the project based on given indicators and the indicated fee is paid by the “Actor”. |
| “DOA” selects a “Consultant” from a roster to carry out the HIA fulfilling specific selection procedures and providing a TOR / HIA category |

For the Department of Archaeology to choose the Consultant who will carry out the HIA, a consultant is chosen from a roster while ensuring capability to carry out the HIA as per the project indicators (especially in respect to the complexity and the required expertise).

**Establishment of Consultant Roster**

The Consultant Roster shall be prepared based on the parameters indicated in the Consultant Roster format (Report Part One 2.3) which includes eligibility, information provided in the registration form (curriculum vitae / company profile attached with information relevant to heritage conservation and the preparation of HIAs. Legal registrations along with PAN and/or VAT registrations shall be submitted). The Consultants are then categorized based on expertise, capacity and experience.

**Choice of Consultant**

When choosing the consultant for any specific HIA, the requirements in respect to expertise, capacity and experience shall be considered. Should any specific expertise be required, this will be negotiated with the consultant before finalizing the TOR and signing the contract. The consultant shall not have any conflict of interest when carry out the HIA.

The choice of the consultant shall be in rotational basis with the next appropriate Consultant on the Roster List being approached to carry out the HIA. This might mean skipping Consultants at the top of the list who might not be appropriate for the given task. The chosen Consultant may decline the task if an acceptable justification is provided. The consultant who has carried out an HIA then joins the list at the bottom again.

**TOR**

Based on the DPR and request letter submitted by the actor, DOA will prepare the TOR for the consultant.
3.2.1 Project Indicators (DOA)

The project / activity report that is submitted by the Actor will need to be first assessed first for its legitimacy. Once that is ascertained, then the project / activity will be assessed for its scale and complexity in respect to preparing the HIA.

The project indicators are the required considerations for assessing scale and complexity of the project / activity to determine the timeframe and cost for the preparation of the HIA:

A. The HIA would generally have three components: (cost based on scope)
   (i) Assessment of proposed project / activity and recommendations for providing permit or for modifications
   (ii) Assessment of past projects and interventions and recommendation for rectification
   (iii) Assessment of future threats and recommendation for planning mechanisms

B. Complexity (cost based on required expertise and team members)
   (i) Simple project / activity in a simple context requiring straightforward assessment by a single consultant
   (ii) Requiring higher level of expertise with multiple consultants involved
   (iii) Requirement of additional specialized consultants for special circumstances

C. Scale (cost based on size of the project and required time for assessment)
   (i) Individual activity – activities other than major construction which could include temporary structures
   (ii) Small project – individual buildings or interventions
   (iii) Large project – large complexes, and infrastructure projects like roads, etc.
   (iv) Special circumstances

D. Location (rough calculations done as per cost to reach site including time)
   (i) Kathmandu Valley
   (ii) Accessible by flight
   (iii) Accessible by road plus up to half day walk
   (iv) Accessible by walking (max 7 days)
   (v) Very remote accessible by helicopter or walking more than a week

The calculations for time and cost shall be done based on the considerations as stated above. Standards shall be developed for each of these points to ensure that they correspond to the actual costs. These calculations shall be shown to the Actor when requesting payment for implementing the HIA.

Standard format- HIA F-2a 2021: Project Indicators and Cost Calculations
Standard format- HIA F-2b 2021 Payment request letter DOA to Actor
### Project Indicators and Cost Calculations

#### 1. Component Factor

<table>
<thead>
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<th>Component Factor</th>
<th>Y/N</th>
<th>Factor</th>
<th>IF YES</th>
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<tbody>
<tr>
<td>1.1 Assessment of proposed project / activity and recommendations for providing permit or for modifications</td>
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<td></td>
</tr>
<tr>
<td>1.2 Assessment of past projects and interventions and recommendation for rectification</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Assessment of future threats and recommendation for planning mechanisms</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost based on scope: **Total factor for 1: F1**

#### 2. Complexity Factor

<table>
<thead>
<tr>
<th>Complexity Factor</th>
<th>Y/N</th>
<th>Factor</th>
<th>IF YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Simple project / activity in a simple context requiring straightforward assessment with single consultant</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Requiring higher level of expertise with multiple consultant Type* and number of expertise required [n]</td>
<td>1+ 0.5n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Requirement of additional specialized consultant for special circumstances</td>
<td>Special calculations required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost based on required expertise and team members: **Total factor for 2: F2**

#### 3. Scale Factor

<table>
<thead>
<tr>
<th>Scale Factor</th>
<th>Y/N</th>
<th>Factor</th>
<th>IF YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Minor activities and small project – individual buildings or interventions</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Large project – larger complexes, roads, etc.</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Special circumstances</td>
<td>Special calculations required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost based on size of the project and required time for assessment: **Total factor for 3: F3**

* Indicate which expertise in which field is specially required

- Architecture
- Archaeology
- Environment
- Engineering
- ........................................

### A. TOTAL REMUNERATION

<table>
<thead>
<tr>
<th>Base Amount inclusive of VAT</th>
<th>xF1</th>
<th>xF2</th>
<th>xF3</th>
<th>Sub-Total A NRS</th>
</tr>
</thead>
</table>

### B. TOTAL EXPENSES (only for travel outside Kathmandu Valley)

<table>
<thead>
<tr>
<th>Expense Description</th>
<th>*persons</th>
<th>numbers</th>
<th>cost</th>
<th>amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 Travel (flight/car)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2 DSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3 Special expenses to be described separately</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sub-total B inclusive VAT NRS

### C. ADMINISTRATIVE COST

<table>
<thead>
<tr>
<th>Expense Description</th>
<th>% of A+B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review cost</td>
<td>15% of A+B</td>
</tr>
<tr>
<td>Admin cost</td>
<td>5% of A+B</td>
</tr>
</tbody>
</table>

Sub-total C inclusive VAT NRS

**TOTAL amount to be paid by Actor** = A + B + C inclusive VAT

In words:
HIA F-2b 2021
Payment request letter DOA to Actor
Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

[Name of authorized person for Actor]
[Official address of Actor]

Date: dd/mm/yyyy

Subject: Request Payment for Heritage Impact Assessment

Dear [Name of authorized person for Actor],

The HIA Committee of the Department of Archaeology has reviewed the submission of your project and request for HIA.

[please delete section which does not apply]

The Committee has not found it necessary to carry out an HIA.

[or]

The Committee has found it necessary to carry out Heritage Impact Assessment. Please find attached a copy of the filled HIA F-2a 2021 form: Project Indicators and Cost Calculations which provides the assessment of required expertise and costing.

Please make the payment of the indicated total amount to the Department of Archaeology so that we can begin the assessment project.

Thanking you for your kind consideration,

Yours sincerely

[Signature]

Director General [stamp]

Attached:
1. Filled HIA F-2a 2021 form: Project Indicators and Cost Calculations
2. Methods of making payment to the Department of Archaeology
3.2.2 Consultant Roster (DOA)

Once the project indicators have been defined and the Actor has paid the cost for the implementation of the HIA, the Department of Archaeology will choose the Consultant who will carry out the HIA. This requires a consultant roster of appropriate consultants who are capable of carrying out the HIA as per the project indicators (especially in respect to the complexity and the required expertise).

The Consultant Roster and choice of contractor shall be done considering:

A. Eligibility
Individuals that have experience in working on heritage conservation are eligible to register. The registration shall however be reviewed by the Department of Archaeology.

B. Registration Form
Candidates shall register by filling out a registration form with a detailed curriculum vitae attached with personal PAN and information relevant to heritage conservation and the preparation of HIAs. Related company with VAT registration shall also be submitted.

The registration form shall be prepared to include names, photos, contact details, short explanation on expertise and experience.

C. Categorization based on expertise and capacity
The consultant once registered shall be categorized based on type of expertise, capacity and experience.

D. Choice of consultant for specific
When choosing the consultant for any specific HIA, the requirements in respect to expertise, capacity and experience shall be considered. Should any specific expertise be required, this will be negotiated with the consultant before finalizing the TOR and signing the contract. The consultant shall not have any conflict of interest when carry out the HIA.

E. Required training
All consultants shall attend at least one training course every year to be allowed to renew their registration. Training courses on HIA shall be provided once a year by the Department of Archaeology. Such training course would need to be closely linked to the gathered experience in implementing HIA in Nepal and taking into account international trends in HIA.

F. Removal of consultant from roster
Consultants shall be removed from the roster should they not perform as per the TOR and contract, not join the required training, carry out a HIA despite conflict of interest or be involved in any inappropriate activity for personal gain.

Standard format: HIA F-3a 2021: Registration of HIA Consultants
Standard format: HIA F-3b 2021: Acceptance to roster letter DOA to Consultant
Registration of HIA Consultants

Please remove highlighted sections and insert relevant information

The consultants will need to prove their interest and involvement in the protection of cultural heritage to be able to take the lead role in carrying out a Heritage Impact Assessment.

Name (Surname in Capitals): .....................................
Preferred title: .................................

Contact Details:  
email: ........................., phone: .........................
address:  ........................................................................

PAN Registration: ........................................................................

Registered Consultancy: ........................................................................

VAT Registration: ........................................................................

Academic qualifications:  ........................................................................

Relevant Field of expertise:  
□ Architect □ Archaeology □ Environment □ Engineering
□ ..................................................

Relevant experience in years: ...................................

Language for reports  
□ Nepali □ English □ ..........................................

Heritage Impact Assessment Compulsory Training  
(to be updated annually with month and year)

<table>
<thead>
<tr>
<th>mm/yyyy</th>
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</tbody>
</table>

*Heritage Impact Assessment Experience  
(list successfully completed HIA to be updated annually)

1. Attached: Detailed Curriculum Vitae
Acceptance to roster letter DOA to Consultant

Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

[Name of Consultant]
[Official address of Consultant]

Date: dd/mm/yyyy

Subject: Acceptance to HIA Consultant Roster

Dear [Name of Consultant],

The HIA Committee of the Department of Archaeology has reviewed your draft registration and request to be included on the HIA roster of consultants.

[please delete section which does not apply]

The Committee has not found your application acceptable due to lack of:

- □ Training
- □ Experience
- □ Qualifications

[or]

The Committee has found your application acceptable and has included you on the HIA Consultant Roster for the year [………..]. Please note that your registration will need to be renewed yearly and your registration is condition to your successfully completion of the annual HIA training carried out by the DOA. We request you to carry out the task of preparing HIAs with due diligence, integrity and confidentiality.

Thanking you,

Yours sincerely

[Signature]

Director General

Attached:

1. Filled HIA F-3a 2021 form: Registration of HIA Consultants
3.2.3 TOR for HIA preparation (DOA)

As per the Project Indicators and with the choice of consultant, a contract shall be signed between the Department of Archaeology and the consultant to carry out the Heritage Impact Assessment. The consultant TOR shall contain at least the following points. (The TOR can be standardized with parts that would need to be filled as per the specific conditions of the project / activity)

A. Short description of project
   What type of project / activity with short description as per Detailed Project Report and Request Letter from the Actor.

B. Scope of work
   The TOR shall indicate the scope of the assignment in respect to the three possible components responding to the objectives of the HIA process. These would be whether the HIA would need to assess
   - proposed project / activity and recommend permit or modification;
   - assess past projects and recommend interventions for rectification;
   - assess future threats and recommend planning mechanisms

C. Complexity of project / activity
   The TOR shall indicate the complexity of the project based on the requirement of experts and the organization of the team members. The categorization will be based on the following categories used to calculate the remuneration.
   - Simple project / activity in a simple context without specialized expertise.
   - Requiring higher level of expertise but in standard fields of cultural heritage
   - Requirement in additional specialized fields such as technical or social fields

D. Scale of project / activity
   The TOR shall indicate the scale of the project which can be categorized depending on the size but also the extent of the intervention.
   - Individual activity or small project – individual buildings or interventions
   - Large project – larger complexes, roads, etc.
   - Special circumstances requiring detailed investigation.

E. Location
   Categorization based an ease of access to the location
   - Kathmandu Valley
   - Accessible by flight
   - Accessible by road plus up to half day walk
   - Accessible by walking (max 7 days)
   - Very remote accessible by helicopter or walking more than a week

F. Standard Conditions of Contract
   - Time frame
   - Remuneration and mode of payment
   - Standard contract requirements

Standard format: HIA F-4a 2021: Consultant’s TOR for HIA

Standard format: HIA F-4b 2021: HIA request letter DOA to Consultant
Establishing Heritage Impact Assessment (HIA) in Nepal

**HIA F-4a 2021**

Consultant’s TOR for HIA

Please remove highlighted sections and insert relevant information

Name of Lead Consultant: 

Name of Consultancy: 

Name and location of Project: 

The Department of Archaeology requests the consultant to carry out a Heritage Impact Assessment as per the **standard procedures and format** provided herewith. The Consultant shall carry out at least one site visit.

**Short description of Project:**

**Scope of expertise:**
- □ proposed project / activity and recommend permit or modification;
- □ assess past projects and recommend interventions for rectification;
- □ assess future threats and recommend planning mechanisms

**Required expertise:**
- □ Simple project / activity in a simple context without specialized expertise.
- □ requiring higher level of expertise but in standard fields of cultural heritage
- □ Requirement in additional specialized fields such as technical or social fields

**Scale of project / activity**
- □ Individual activity – small project – individual buildings or interventions
- □ Large project – large complexes, infrastructure project like roads, etc.
- □ Special circumstances requiring detailed investigation.

**Timeframe:**
The HIA shall be completed and submitted to the Department of Archaeology in soft and hard copy within _______ days* of signing the contract. Should additional information be required, or detailed investigations be carried out, the time can be extended by mutual agreement, but only to a maximum of double the days indicated.

**Remuneration:**
For the successful implementation and submission of the HIA, the consultant shall be provided the remuneration and where relevant the expenses as calculated based on the entry in the **HIA F-2 2021 form: Project Indicators and Cost Calculations.**

* the required time will be calculated based on the size and complexity of the project, as well as, if outside the Kathmandu Valley, the time required for one visit to the site. The time will be roughly calculated taking 14 days as the base and multiplying it with the factors from Section A of the HIA F-2 2021 form, adding the days required for the site visit SV.

Total Days = (14 x F1 x F2 x F3) + SV
Subject: Request for preparation of a Heritage Impact Assessment

Dear [Name of Consultant],

The HIA Committee of the Department of Archaeology requests you to take the lead role in carrying out an HIA.

Attached are the following documents that will provide you with information on the project:

- DPR provided by the Actor

Attached are the documents that will provide you with information on carrying out the HIA:

- Filled HIA F-2a 2021 form: Project Indicators and Cost Calculations
- Filled HIA F-4a 2021 form: Consultant’s TOR for HIA

On acceptance of the conditions, including details concerning arrangements for site visits and timeframe, a contract will be prepared and signed between the two parties.

We request you to carry out the task of preparing the HIA with due diligence, integrity and confidentiality.

Yours sincerely

[Signature]

Director General

Attached:

As noted above
3.3 Process of preparation and review of HIA

As per the overall process the Consultant is selected and a TOR is prepared as per the required HIA for the proposed project / activity. The Consultant would then need to carry out the HIA based on standard formats. These would then be reviewed by the Advisory Body.

"DOA" selects a "Consultant" from a roster to carry out the HIA fulfilling specific selection procedures and providing a TOR / HIA category

The chosen "Consultant" prepares the HIA as per the TOR / HIA category and based on defined HIA formats and submits it to "DOA"

"DOA" sends the HIA to an "Advisory Body" that reviews the HIA and approves or provides comments / recommendations

Preparation of HIA by the consultant

The TOR would define the overall requirement as per the Project Indicators. The project indicators are the required considerations for assessing scale and complexity of the project / activity to determine the timeframe and cost for the preparation of the HIA. These include Categories, Complexity, Scale and Location.

The HIA would any one, two or all three components: (for each of these components detailed content formats would need to be prepared.

(i) Assessment of proposed project / activity and recommendations for providing permit or for modifications

(ii) Assessment of past projects and interventions and recommendation for rectification

(iii) Assessment of future threats and recommendation for planning mechanisms

The consultant will be required to:

- Visit the site and study the circumstances as they are on location
- Define its values and determine the most important attributes and elements of the heritage site, monument, historic building and/or cultural objects
- Determine the impact and threats to the attributes and elements that express the value of the heritage

Review by the Advisory body

The HIA report that is submitted by the Consultant shall be reviewed by the Advisory Body. DOA then takes the decision based on the report submitted by the consultant and recommendation provided by the advisory body.
3.3.1 HIA categories and submission by the consultant

The HIA categories are based on the three objectives of the HIA procedure. These would be:

1. **proposed project / activity and recommend permit or modification**
   
The project / activity that the actor is proposing to carry out near a heritage site, monument, historic building or cultural object must be assessed in respect to its possible impact. According to the assessment a recommendation is formulated by the consultant for action to be taken by the Department of Archaeology.

   The assessment outcome should either provide a recommendation to allow for the project / action to be carried out (with justification) or if not, detailed recommendations for modifications to the project / activity need to be provided. The Department of Archaeology will need to be able to either allow the project / activity to move ahead as proposed or then should provide specific recommendations to be adopted by the Actor to be allowed to continue. In certain cases a project might be outright rejected.

2. **assess past projects and recommend interventions for rectification**
   
   Should there be previous projects / activities that have been carried out in the same area impacting the same heritage site, monument, historic building or cultural object, the Consultant shall assess the impact of these. These might be directly linked to the proposed project or might only be linked by location, but all that which is impacting the specific heritage must be assessed.

   Should there be any impact caused by these previous projects / activities, recommendations need to be provided by the Consultant to the Department of Archaeology on what kind of interventions would be required for the rectification. These rectifications might not have anything to do with the Actor which would then require a different approach and means of rectification.

3. **assess future threats and recommend planning mechanisms**
   
The assessment of a proposed project / activity in a given heritage site, monument, historic building or cultural object would be the right opportunity to assess future threats and begin putting in planning mechanisms.

   If existing plans or management systems have been established, these can be assessed in respect to their effectiveness. If there are no plans in place, proposed interim measures need to be provided. These would include at least basic buffer zones and control mechanisms for threats that could be implemented by local authorities.

Any assessment can consist of any one, two or all the components depending on the circumstances.

**Standard format** - HIA F-5a 2021: HIA submission format

**Standard format** - HIA F-5b 2021: HIA submission letter format Consultant to DOA
1. Executive Summary with overall recommendations

**Overall recommendations:** ☐ acceptable  ☐ with conditions*  ☐ not acceptable

*conditions to be fulfilled:

2. Justification for recommendations

Clarification of impact of project/actions on specific cultural attributes

Note: For World Heritage properties special consideration needs to be made for the impact on attributes that express outstanding universal value (OUV).

3. HIA components

Ensure all components are addressed as defined in the TOR and identified in the ‘HIA F-2a 2021form: Project Indicators and Cost Calculations’.

3.1 Proposed project / activity and recommend permit or modification

To assess impact based DPR and any other materials that are provided. The final outcome will be recommendations to permit project/activity, suggest conditions to be fulfilled before providing permission, or rejection of the proposed project.

3.2 Assess past projects and recommend interventions for rectification

To assess impact based DPR and any other materials that are provided, as well as investigating status on site. The final outcome will be recommendations for possible rectification to reduce impact as applicable.

3.3 Assess future threats and recommend planning mechanisms

This component requires planning for the given site in a broader context, particularly considering long-term impacts, and impacts that might not be directly or immediately visible.
Director General,
Department of Archaeology,
Ramshahpath,
Kathmandu, Nepal

Date: dd/mm/yyyy

Subject: Submission of Heritage Impact Assessment

Dear Director General,

It is our great pleasure to submit this Heritage Impact Assessment which we have carried out as per the TOR and related instructions.

The assessment has been carried out as per the instructions provided in the HIA F-2a 2021 form: Project Indicators and Cost Calculations, the HIA F-4a 2021 form: Consultant’s TOR for HIA and the HIA F-5a 2021 form: HIA submission format.

Please find attached the Heritage Impact Assessment report on [name of project] and Site Visit report.

[please indicate here if there are any issues or comments]

Thanking you,

Yours sincerely,

[Signature]

[Name of authorized person] [stamp]

Attached:
1. HIA report- 1 hard copy + soft copy in pdf
2. Site visit report, (including copies of all receipts if applicable)
3.3.2 Recommendation by the Advisory Body

The HIA report that is submitted by the Consultant shall be reviewed by the Advisory Body. The advisory body shall ensure that the basic requirements of the TOR have been fulfilled while reviewing the overall assessment in respect to the three components.

The Advisory Body shall carry out a desk review and only if there are major conflicting issues will someone be sent to assess the site.

The main points that the Advisory Body will check:

1. **Overall process and content**
   The Advisory Body shall check the process of preparing the HIA report by the Consultant which would also include legal and ethical issues. The Advisory Body shall check the content of the HIA report prepared by the Consultant based on the TOR and discussions.

2. **The assessment and recommendations for each HIA category**
   The Advisory Body shall check the assessments carried out by the Consultant, especially whether they are correct and acceptable within the prevalent understanding of conservation practice. Closely linked to this is also the checking of the relevance of the recommendations made by the Consultant.

The Advisory Body shall provide a note and recommendation which will include the outcome of their review of the Consultant Report. The points that would make up the Advisory Body note and recommendation:

1. **Note on process and content**
   The Advisory Body shall provide notes to the Department of Archaeology on the process and content of the Consultants preparation of the HIA. This would include the assessment of legal and ethical issues.

2. **Note on assessment and recommendations**
   The Advisory Body shall provide notes to the Department of Archaeology on the assessments done by the Consultants and particularly comment on the recommendations. This would especially focus on whether the assessments and recommendations are based on the prevalent understanding of conservation.

3. **Recommendation on Consultants report**
   The Advisory Body may recommend the adoption of the Consultant report, the adoption with amendments, the return of the report to the Consultant for further clarifications and detailing or the total rejection of the Consultant report.

<table>
<thead>
<tr>
<th>Standard format: HIA F-6a 2021: HIA comment request letter DOA to Advisory Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard format: HIA F-6b 2021: Advisory Body Comment Format</td>
</tr>
<tr>
<td>Standard format: HIA F-6c 2021: HIA comment submission letter format from Advisory board to DOA</td>
</tr>
</tbody>
</table>
HIA F-6a 2021

HIA comment request letter DOA to Advisory Body
Please remove highlighted instructions and insert relevant information

[LETTERHEAD]

[Name of Advisory Body]
[Official address of Advisory Body]

Date: dd/mm/yyyy

Subject: Request for Comments on Heritage Impact Assessment

Dear [Name of Advisory Body],

Please find attached the HIA submitted by the Consultant for the [name of project]. I request you to review the HIA and provide comments within [number] days of receiving this letter as per HIA F-6b 2021 form: Advisory Body Comment Format. Attached are also project documents for your reference.

Thanking you,
Yours sincerely,

[Signature]

Director General

[stamp]

Attached:
1. HIA submitted by Consultant
2. DPR provided by the Actor
3. Filled HIA F-2a 2021 form: Project Indicators and Cost Calculations
4. Filled HIA F-4a 2021 form: Consultant’s TOR for HIA
Establishing Heritage Impact Assessment (HIA) in Nepal

HIA F-6b 2021
Advisory Body Comment Format

Please remove highlighted sections and insert relevant information

Project:  

Consultant:  

Advisory Body Lead:  

The HIA was received on:  
Submission of Comments:  

Overall suggestion  □ adoption  □ adoption with modifications  □ rejection

Proposed decision:  □ agree  □ disagree

Comments on consultant’s decision on the impact of the project on the cultural heritage

Proposed recommendations:  □ agree  □ reservations  □ disagree

Comments on the consultant’s recommendation on how to mitigate the impact

Process and Content:  □ agree  □ reservations  □ disagree

Comments on the process, including legal and ethical considerations
Director General,
Department of Archaeology,
Ramshahpath,
Kathmandu, Nepal

Date: dd/mm/yyyy

Subject: Heritage Impact Assessment comment submission

Dear Director General,

We received the Heritage Impact Assessment of the [name of project] prepared by [name of consultant]. We have reviewed the Heritage Impact Assessment and have provided our comments on the attached ‘Advisory Body Comment’ report.

Please do not hesitate to contact us if there are any further questions on the project or the HIA. We remain at your disposal.

Thanking you,
Yours sincerely,

[Signature]

[Name of authorized person] [stamp]

Attached:
1. Advisory Body Comment - 1 hard copy + soft copy in pdf
3.3.3 Official letter from DOA with decision to the Actor

The Department of Archaeology will determine the outcome of the HIA based on the Consultant’s report and the Advisory Bodies recommendations. Once this process has been finalized the Department of Archaeology will formulate and send to the Actor a letter with the final decision. This letter would be a legal document that would be legally binding.

The Official Letter that is sent by the Department of Archaeology to the Actor shall contain at least the following points:

1. **Final Decision**
   The Department of Archaeology shall formulate the final decision as a response to the application for a HIA submitted by the Actor. The final decision can be in short any of the following three options:
   (i) acceptance of proposal as submitted
   (ii) acceptance of proposal but with amendments
   (iii) rejection of proposal

2. **Justification**
   The Department of Archaeology shall provide a justification to the decisions that has been taken. This would need to be linked to appropriate legal provisions as well as the assessment carried out by the consultant and review by the advisory body.

3. **If applicable required amendments to the project**
   If applicable, the Department of Archaeology shall provide detailed information on the required amendments to the project which shall be binding if the Actor would want to continue with the project / activity.

4. **Notes on related decisions on rectifications and planning**
   The Department of Archaeology shall provide information related to the assessment and rectification of past projects and activities as well as planning recommendations to safeguard the site from potential threats. This information will become part of the overall guiding principles for the implementation of the proposed project.

5. **Validity of decision**
   The Department of Archaeology shall provide exact dates for the validity of the decision, which means the project / activity would need to be completed and be ready for final assessment by a given date of expiry of permission.

Standard format- **HIA F-7a  2021**: Final decision format from DOA
Standard format- **HIA F-7b  2021**: Final letter format from DOA to Actor
Standard format- **HIA F-7c  2021**: Final letter format from DOA to Consultant
Standard format- **HIA F-7d  2021**: Final letter format from DOA to Advisory body
Establishing Heritage Impact Assessment (HIA) in Nepal

HIA F-7a 2021
Final HIA decision format from DOA
Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

Name of Actor (Applicant): 

Name of Project: 

Location: 

Date of application: dd/mm/yyyy  Date of decision: dd/mm/yyyy

Overall recommendations: □ acceptable  □ with conditions*  □ not acceptable

Justification and related legal provisions

*conditions to be fulfilled:

Required rectification (for Category 2 - Assess past projects)

Required planning (for Category 3 – Assess future threats)

[Signature]

Director General  [stamp]
HIA F-7b 2021

Final letter format from DOA to Actor

Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

[Name of authorized person for Actor]
[Official address of Actor]

Date: dd/mm/yyyy

Subject: Final decision of Heritage Impact Assessment

Dear [Name of authorized person for Actor],

The HIA Committee of the Department of Archaeology has come to the final decision on the project [name of project]. The decision has been based on the Heritage Impact Assessment received from the competent consultant, with the additional comments from the advisory body.

Please find attached the filled ‘HIA F-7a 2021: Final HIA decision format’.

Please keep us informed on any further progress or changes to the circumstances of the project. Please note that should the project be accepted for implementation, regular reporting and monitoring will take place and a completion certificate will need to be obtained after successful completion ensuring compliance with the decisions provided on the attached form.

Thanking you for your cooperation.

Thanking you,

Yours sincerely,

[Signature]

Director General

[stamp]

Attached:

1. HIA F-7a 2021: Final HIA decision format’
HIA F-7c 2021
Final letter format from DOA to Consultant
Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

[Name of Consultant]
[Official address of Consultant]

Date: dd/mm/yyyy

Subject: HIA completion

Dear [Name of Consultant],

Thank you for your contribution to the preparation of the HIA of the [name of project]. Please submit your payment request letter.

We request you to provide your continued services should there be further issues that arise from this project.

Thanking you for your continued collaboration.

Yours sincerely

[Signature]

Director General

[stamp]
[DOA LETTERHEAD]

Date: dd/mm/yyyy

Subject: HIA completion

Dear [Name of Advisory Body],

Thank you for your contribution to the preparation of the HIA of the [name of project]. Please submit your payment request letter.

We request you to provide your continued services should there be further issues that arise from this project.

Thanking you for your continued collaboration.

Yours sincerely

[Signature]

Director General

[stamp]
3.3.4 Recourse process for Actors

As per the overall process an official letter is sent by the Department of Archaeology to the Actor with the final decision in respect to the HIA. Should the Actor not be agreeable to the decision, recurrence is possible.

Based on the HIA Report and the comments / recommendations, “DOA” prepares the final decision and sends official letter to the “Actor”

Recourse process if necessary for “Actor” against the decision of “DOA”

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

The Official Letter that is sent by the Department of Archaeology to the Actor contains at least the following points:

1. **Final Decision:** (i) acceptance of proposal as submitted, (ii) acceptance of proposal but with amendments or (iii) rejection of proposal
2. **Justification:** justification to the decisions that has been taken linked to appropriate legal provisions as well as the assessment.
3. **If applicable required amendments to the project:** detailed information on the required amendments to the project.
4. **Notes on related decisions on rectifications and planning:** information related to the assessment and rectification of past projects and activities as well as planning recommendations to safeguard the site from potential threats.
5. **Validity of decision:** exact dates for the validity of the decision, which means the project / activity would need to be completed.

Refer: HIA F-7a 2021: Final HIA decision format DOA

For any of these points recurrence can be taken with a clear justification for the Department of Archaeology to reconsider. The recurrence would be submitted as a written document with the necessary references and justification (reasoning and legal provisions) to back up the recurrence claim.

This would then be discussed with the Consultant and the Advisory Body taking into account the justification provided by the actor. A revised Official Letter will then be sent to the Actor with the response to the recurrence. Recourse can be taken repeatedly, however no work may begin without the dispute being finalized.
4. Monitoring and enforcement of the HIA (Component 3)

The third phase of the HIA is to ensure that the outcome of the assessment is agreed upon and followed. Reviewing the past HIAs that have been carried prepared, enforcement and compliance has been an issue. This has particularly been the case when a certain development has been agreed upon, however, only if certain conditions were met. In most cases, the development was carried out, while the conditions were not adequately fulfilled. This means, both monitoring and enforcement procedures need to be improved.

CARRYING OUT HIA
(Component 2)

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

Process of legal action if necessary against non-compliance to decisions of “DOA” by “Actors”

On completion of project/action by “Actor” a final review is carried out by “DOA” with the “Consultant” and “Advisory Body” to provide a certification of compliance

Note

Procedures for legal recourse to non-compliance need to be carefully planned within the legal provisions of the country. This aspect is critical to ensure that the HIA becomes an effective tool to protect heritage, while finding appropriate means for development activities to take place.
4.1 Processes for Monitoring and enforcement of the HIA

For the third components, the Monitoring and enforcement of the HIA the following processes will be required. Draft processes are being provided in this report. These would still need to be discussed with experts and site managers. Only after several trial runs on practical Heritage Impact Assessments can these be finalized and adopted as standard formats.

Required processes:
- Reporting by Actor
- Monitoring by DOA
- Process of legal action by DOA
- Process of final review by DOA / Consultant / Advisory Body
4.1.1 Reporting by Actor

As per the overall process when the Actor receives the official letter and all disputes are clarified and agreed upon and if permission is given, the Actor will start the project / activity. During the entire process the Actor shall provide the Department of Archaeology with detailed reports as defined in the Official Letter.

Based on the HIA Report and the comments / recommendations, “DOA” prepares the final decision and sends official letter to the “Actor”

Recourse process if necessary for “Actor” against the decision of “DOA”

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

The reporting by the Actor to the Department of Archaeology shall be done based on the conditions defined in the Official Letter. The reporting shall include progress as well as any changes or new insights into the circumstances. Any new information on the heritage site would be passed on to the Department of Archaeology

4.1.2 Monitoring by DOA

As per the overall process, if found necessary, the Department of Archaeology may carry out monitoring of the project / activity at any time.

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

Process of legal action if necessary against non-compliance to decisions of “DOA” by “Actors”

On completion of project/action by “Actor” a final review is carried out by “DOA” with the “Consultant” and “Advisory Body” to provide a certification of compliance

Should the reporting by the Actor not seem sufficient, the Department of Archaeology can establish its own monitoring of the project / activity. This means that any supervisor can be deputed to oversee activities. This can be full time or at specific intervals as found necessary.
4.1.3 Process of legal action by DOA

As per the overall process, should there be any part of the project implementation that does not comply with the Official Letter, the Department of Archaeology may stop work and take legal action against the Actor.

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

Process of legal action if necessary against non-compliance to decisions of “DOA” by “Actors”

On completion of project/action by “Actor” a final review is carried out by “DOA” with the “Consultant” and “Advisory Body” to provide a certification of compliance

During the course of the Project / Activity if there is any concern about the on-going process, the Department of Archaeology may stop the work, request rectification or if necessary take legal action. This would then revert to the courts; however a stay order must be issued to ensure that the project / activity halts.

4.1.4 Process of final review by DOA / Consultant / Advisory Body

As per the overall process once the project / activity is completed, a final review shall be carried out by the Department of Archaeology in consultation with the Consultant and the Advisory Body in the presence of the Actor.

“Actor” implements as per decision with reporting to “DOA” as indicated in the official letter while allowing for necessary monitoring by “DOA”

Process of legal action if necessary against non-compliance to decisions of “DOA” by “Actors”

On completion of project/action by “Actor” a final review is carried out by “DOA” with the “Consultant” and “Advisory Body” to provide a certification of compliance

Should compliance be found with all points mentioned in the Official Letter, a certificate of compliance shall be awarded to the Actor which allows for full legal recognition of the Project / Activity.
4.2 Certification of compliance (DOA)

On completion of the project / activity or latest by the final date of expiry of the permission the Department of Archaeology shall assess the project. This assessment shall be carried out in consultation with the Consultant and the Advisory Body in the presence of the Actor.

The requirements that need to be fulfilled for issuance of the Certificate of Compliance are as follows:

1. **Final Decision**

   Compliance to final decision as stated in the Official Letter sent by DOA which could be either (i) acceptance of proposal as submitted; (ii) acceptance of proposal but with amendments or (iii) rejection of proposal.

2. **If applicable required amendments to the project**

   Compliance to required amendments to the project where relevant as stated in the Official Letter sent by DOA.

3. **Notes on related decisions on rectifications and planning**

   Compliance to related rectifications and planning provisions defined in the Official Letter sent by DOA.

4. **Validity of decision**

   Compliance to timeframe as defined in the Official Letter sent by DOA.

Should the assessment of the project / activity show that there was no or not sufficient compliance, legal steps would need to be taken to rectify the situation. In the meantime if any cultural heritage is irreversibly affected, more severe consequence must be ascertained.

---

**Standard format**: HIA F-8 2021: *Certificate of compliance from DOA to Actor*
HIA F-8 2021
Certification of compliance from DOA to Actor
Please remove highlighted instructions and insert relevant information

[DOA LETTERHEAD]

[Name of authorized person for Actor]
[Official address of Actor]

Date: dd/mm/yyyy

Subject: Certification of Compliance

Dear [Name of authorized person for Actor],

This is to certify that the project [name of project] has been carried out as per the decisions of the HIA Committee of the Department of Archaeology dated: [date of DOA decisions].

The status of the project has been reviewed and documented by the Department of Archaeology, with the HIA Consultant and representative of the Advisory Body has witness. Any further changes may only be carried out after obtaining separate permission from the Department of Archaeology.

Thanking you for your continued collaboration.

Yours sincerely

[Signature]

Director General  [stamp]
Final Report of
Air Pollution Monitoring Program in Lumbini

Submitted to
Ministry of Science Technology and Environment
Singha Durbar, Kathmandu

Submitted by
Technocrat Consultancy
Kathmandu, Nepal

July, 2015
ACKNOWLEDGEMENT

We would like to thank the Ministry of Science, Technology and Environment (MoSTE) for providing an opportunity for carrying out the Air Pollution Monitoring study Program in Lumbini.

We extend our gratitude to all those who have been involved in this study and also for their valuable input. We would also like to thank Environment Management Division of MoSTE, the study steering committee members, and the staff of Lumbini Development Trust (LDT). We would like to convey special thanks to Leaders Nepal for their technical support by providing equipment and devices for air pollution monitoring.

We would also like to thank all officials of the Government of Nepal, LDT and general public for providing valuable information during field visit of the study.

Study Team
Executive Summary

Lumbini, a historical place, the birthplace of Lord Buddha, and a UNESCO World Heritage Site, is a destination for pilgrims and visitors from all around the world. According to the recorded history, three famous Chinese travellers; Tseng Tsai (4th century AD) Fa-Hsien (5th century AD) and Hiuen – Tsang (7th century AD) visited Lumbini. This visit was followed by several Kings, Presidents, Prime ministers from several countries, 5 Secretary Generals of United Nations and also 1.2 millions of Buddhists and non-Buddhists visit every year. Lumbini is renowned for its rich cultural heritage and value not only in Nepal but in the whole world as well. Therefore, it is imperative that, it be kept environmentally safe and sound. However, these days environmental degradation can be seen in this area due to various reasons viz. industrial pollution, rapid urbanization, increased vehicular pollution and some other human activities. All these cause interference to the Lumbini Protected Zone (LPZ), which is imperiling the world heritage site.

Considering the growing environmental problem in this area, Ministry of Science, Technology and Environment (MoSTE) decided to study and monitor air quality vicinity to Mayadevi Temple two times during the study period on pre and post winter season. The objectives of this study were to propose policy recommendations to minimize the problem and develop plans for the conservation of the LPZ. The methodologies adopted in the study are: literature reviews, expert consultations, 48 hours continuous air quality monitoring of 10 different parameters. Modern equipments were used to measure air quality parameters.

The result indicates that, out of the 10 different parameters monitored, 5 of them ie, TSP, PM$_{10}$, PM$_{2.5}$, Pb and O$_3$ are above the national standard. The dust particles are found higher than standard, gases other than Ozone are below the standard and Pb is above the national standard also level of Mercury on air is high.

Eighty one small and medium size industries that include hotels, cements, bricks, steel and lots of construction works were observed during study, which are considered as contributing factors of pollution. There is need of further detail study to trace out the actual source of pollutant, which could not be completed due to limitation of this study. Trans boundary movement of air is also subject of further study as large number of brick kilns and other industrial activities in Uttar Pradesh of India might contribute to the air pollution of Lumbini significantly.
This study recommends short-term and long-term measures to address the challenges of environmental pollution in this area. As short-term measures, this study proposes to consider continuous assessment of air quality, awareness program to local people to minimize local air pollution, and taking effective action by government for non-compliance. And implementation of mitigation measures by industrial sector to control pollution. As long-term measure, the study recommends for taking a sustainable approach by initiating a process of introducing air pollution control mechanisms and also transferring some of the most polluting industries from LPZ.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>B-L Road</td>
<td>Bhairahawa Lumbini Road</td>
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<tr>
<td>BZ</td>
<td>Benzene</td>
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<td>CO</td>
<td>Carbon monoxide</td>
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<tr>
<td>LDT</td>
<td>Lumbini Development Trust</td>
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<td>LMP</td>
<td>Lumbini Master Plan</td>
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<td>LPZ</td>
<td>Lumbini Protected Zone</td>
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<td>LWHP</td>
<td>Lumbini World Heritage Property</td>
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<td>MoSTE</td>
<td>Ministry of Science, Technology and Environment</td>
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<td>mt</td>
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1. INTRODUCTION

1.1 Background

Lumbini, where the Gautama Buddha was born in 623 B.C. is one of the most sacred places of all Buddhists. Worldwide attention is focused on it not only because pilgrims and tourists visit from all over the world. It has a special meaning as a place of meditation and spiritual renewal, a center of cultural exchange and a symbol of peace. This is one of the most important reasons behind the high acclamation of Nepal and is a treasured heritage for the country. Lumbini is also famous for its ancient highly civilized inhabitants and the natural prosperity of the place. It is said that the place holds the devotional Buddha feelings. This area is rich in the flora and fauna and it is in increasing trend due to increasing greenery within the boundary area.

Lumbini is in Rupandehi district, western part of Nepal which is rich in cultural, spiritual and religious values. The sacred site is the pride of Nepal and has potential to become a major source of revenue for the country. This, the birthplace of Lord Buddha, was inscribed onto the United Nations Educational, Scientific and Cultural Organization's (UNESCO) World Heritage List in 1997. The land use pattern around the Lumbini, World Heritage Property (WHP), has undergone a significant change from agricultural to industrial use in the last two decades. As a result, the universally outstanding archaeological remains in the Lumbini WHP are ruined by rapid development of the area.

In order to address these adverse impacts, in November 2009 the Government of Nepal (GoN) decided that polluting industries would not be allowed to operate in the Lumbini Protected Zone (LPZ), as well as in an 800 meter designated area on both sides of the Bhairahawa-Lumbini Road (B-L Road). Despite the government ruling on sensitive industrial development and environmental protection measures, adverse environmental and social impacts have been observed in the WHP. Realizing this fact, Ministry of Science, Technology and Environment has conducted Air Quality Monitoring study in Lumbini area to find out the status of air quality level in this area and policy recommendation for its minimization.
1.2 Objective

The following are the main objectives of the study

- To find out daily air quality level of Lumbini vicinity to Maya Devi Temple.
- To compare the results of pre- and post-winter monitoring.
- To generate data for policy recommendations to control and minimize the air pollution problem.

1.3 Limitation of Study

Short study period and inadequacy of baseline information of the study area are main limitations of the study. Similarly, shortage of sufficient information on production process and production capacities of industries, lack of statistics on boiler and diesel generators capacities, heavy rain during monitoring, lack of meteorological data of the site and lack of information on trans boundary movement air pollution are the major constraints of the study.

2. LITERATURE REVIEW

2.1 Ambient air pollution

Ambient air pollution is the contamination of the outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the air. Household fuel combustion, motor vehicles, industrial facilities are common sources of air pollution. Pollutants of major public health concern include particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. Outdoor air pollution cause respiratory and other diseases, which can be fatal.

Mostly, air pollution is due to human activities and derives from poor combustion of fossil or biomass fuels. Urban outdoor air pollution refers to the air pollution experienced by populations living in and around urban areas.
2.2 Sources of air pollution

Air pollution can result from both human and natural phenomena. Natural events that pollute air include forest fires, volcanic eruption, wind erosion, pollen dispersal, evaporation of organic compounds and natural radioactivity. Pollution from natural occurrences is not very often. Human activities that result in air pollution include the following.

2.2.1 Emissions from industries and manufacturing activities

Manufacturing industries and power plants emit high levels of air pollutants namely Particulate matter, carbon monoxide, organic compounds, and chemicals into the air.

2.2.2 Burning Fossil fuels

After the industrial age, transportation has become a key part of our lives. Buses, cars, heavy duty trucks, trains, shipping vessels airplanes, etc. all burn lots of fossil fuels emitting huge quantity of pollutants in an atmosphere. Emissions from automobile engines contain both primary and secondary pollutants.

2.2.3 Household and Farming

Crop dusting, fumigating homes, household cleaning products or painting, use of pesticide and fertilizer during farming also emit harmful chemicals into the air and cause pollution.
2.3 Legal Framework

The following legal frameworks have been reviewed:

**Interim Constitution of Nepal, 2007**

This is the supreme law of the country. Article 35 (5) of Interim Constitution proclaims that: “The State shall make necessary arrangements to maintain a clean environment. The State shall give priority to the protection of the environment and also to the prevention to its further damage due to physical development activities by increasing the awareness among the general public on the environmental cleanliness and the State shall also make arrangements for the special protection of the environment and the rare wildlife.

**Environmental Protection Act, 1997, Environmental Protection Rules, 1997 and Standards**

Government of Nepal has enforced the Environmental Protection Act (EPA) and Environmental Protection Rules (EPR) in 1997 aiming the protection of environment. Clause 7 of EPA states, "Nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment or likely to be hazardous to public life and people's health, or dispose or cause to be disposed sound, heat radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards".

In addition to this, rules 15 states, "No person shall emit or cause the emission of noise, heat, radio-active material and waste from any mechanical means, industrial establishment or any other place in contravention of the standards prescribed by the Ministry by notification published in the Gazette".

Ministry of Science, Technology and Environment has formulated several standards related to air pollution. It has set vehicular emission standards, standards for cement and crusher industries, emission standard for boilers, standard for diesel generators and stack emission standard for brick industries. National Ambient Air Quality Standard, 2069 is the guiding standard and driving force to maintain our ambient air quality within permissible limit, which is attached as annex 1.
National Environmental Impact Assessment Guidelines, 1993

In order to integrate environmental aspects in development projects and programs, the government had developed the National EIA Guidelines (1993). The guidelines provide criteria for project screening and Environment Impact Assessment (EIA). This includes scoping, preparation of terms of reference for EIA, methods of EIA report, impact identification and prediction, impact mitigation measures, review of the draft EIA report, impact monitoring, evaluation of impact studies, impact auditing, community participation and schedules and annexes to IEE and EIA. Many of the guideline provisions are now included in the Environment Protection Act, 1997, and the Environment protection regulation, 1997.

Industrial Policy 2067

The main objectives of this Policy, 2067 are: to ensure balanced industrial growth, backward linkage, protect and state support to industries, as well as to adopt the new environmental friendly technologies for the sustainable development of industries. Also the policy envisages creating more employment opportunities and reducing poverty through industrialization. It has also given emphasis to the use of local resources, raw materials and skills as well as encouraging women entrepreneurs. However, the policy does not address the location of major industries that produce carbon emissions. Likewise, the policy also fails to explain the requirements to safeguard national and world heritage sites.

Industrial Enterprise Act, 1992

This Act makes an industrial registration mandatory for activities relating to defined public health and the environment. It has classified industries in 7 different categories including manufacturing, construction and tourism also. This Act gives priority to make arrangements for fostering industrial enterprises in a competitive manner through the increment in the productivity by making the environment of industrial investment more congenial, straightforward. And encouraging the provision for the Industrial Promotion Board to direct industries to make arrangements for controlling environmental pollution.
Industrial Promotion Board

This board has given many directives for the control of pollution owing to operation of industries in Lumbini. Board has banned on establishment of any industry on adjoining 15 k.m. of Mayadevi Temple to address the adverse impacts of air pollution in Lumbini, WHS, in November 2009. It decided that polluting industries should not allowed to operate in the Lumbini Protected Zone (LPZ), as well within 800 meter from designated area on both sides of the Bhairahawa- Lumbini Road (B-L Road). This decision has also restricted to establishments of new industries as well as built-up production capacity of 17 different carbon emitting industries that are already established. It also issued a decree that industries operational at the WHP must respect the Environmental Protection Act, and those that failed to do so would face compulsory relocation within two years.

Board has also setup a task force under the chairmanship of Director, Technology and Environment Division of Department of Industry to provide policy recommendations on technical, social and environmental issues of industries established in B-L road.

2.4 International Convention

A number of legally-binding international instruments (conventions, treaties, protocols or agreements) have been adopted for the conservation of biological species and the natural environment. Nepal has also ratified/accessed numbers of such instruments which has imparted the country many obligations on conservation of natural environment and biodiversity. As per the Nepal Treaty Act, 1991 [Section 9(1)], one of such instrument is:

UNESCO World Heritage Convention (WHC)

This convention observes the concept that cultural heritage and natural heritage are increasingly threatened with destruction, not only by the natural causes of decay, but also by changing social and economic conditions which aggravate the situation even more. It recognizes that deterioration or disappearance of any item of cultural or natural heritage constitutes a harmful impoverishment of the heritage of all nations of the world. Lumbini was listed in the World Heritage List on December 6, 1997.
3. MATERIALS AND METHODOLOGY

3.1 Sampling site

Lumbini Development Trust (LDT) building, which is 200 meter far from Mayadevi Temple was selected as a site for 48 hours sampling. This study involved monitoring for the pre-winter and post-winter timings. Sampling for pre winter monitoring was done on 6 to 8th January 2015 (i.e. Poush 22-24, 2017) whereas sampling for post winter monitoring was conducted on 9th to 11th March 2015 (i.e. Falgun 25-27, 2071).

It was planned to conduct the study in Mayadevi temple but this could not be possible due to security problem in that area and site was confirmed as per the suggestion of LDT staffs. During the 1st sampling, the morning was foggy and rainfall had occurred two days before the sampling data while there was very little sunshine during the day time. The day was clear and sunny during the 2nd monitoring. Movement of very few vehicles near sampling site was recorded but numbers of visitors around the site were quite high.

The bus park of Lumbini is located about 2 km and taxi stand, nearby main gate of this temple, is located around 500 far from sampling site. There is an armed police camp near the sampling site where burning of firewood for cooking was reported. Nepal telecom has its tower nearby this site where they used diesel generators during electricity interrupt. Similarly, the generators used in hotels and temples and its construction work as well as single lane road to main gate from main highway are also noticed as sources of pollution. Beside these LDT is allowing vehicles within the boundary of main temple, without any control mechanism, could also be contributed the pollution.

3.2 Parameters analyzed in the study

The parameters of air quality as per National Ambient Air Quality Standard, 2069 and additionally mercury were measured. These parameters were monitored together very first time in Lumbini by Government of Nepal and its health impact and sources are given below. Beside it, trans boundary movement of air pollution could be another potential source of these pollutants.
**Dust and Particulate matter (TSP, PM$_{10}$ and PM$_{2.5}$)**

Sources in study area: These are formed through fuel combustion (e.g., burning coal, wood, diesel), industrial processes, farming (plowing, field burning), and unpaved roads or during road constructions and some other development activities.

Health Impacts: Short-term exposures can worsen heart or lung diseases and cause respiratory problems. Long-term exposures can cause heart or lung disease and sometimes premature deaths.

**Sulphur Oxide (SO$_2$)**

Sources in study area: SO$_2$ comes from fuel combustion especially high-sulphur coal used in industrial processes.

Health Impacts: Aggravates asthma and makes breathing difficult. It also contributes to particle formation with associated health effects.

**Nitrogen Oxide (NO$_2$)**

Sources in study area: Fuel combustion (electric utilities, big industrial boilers, vehicles) and agricultural burning.

Health Impacts: Worsens lung diseases leading to respiratory symptoms, increased susceptibility to respiratory infection.

**Carbon Monoxide (CO)**

Sources in study area: Fuel combustion from vehicles and generators.

Health Impact: Reduces the amount of oxygen reaching the body’s organs and tissues; aggravates heart disease, resulting in chest pain and other symptoms.

**Lead (Pb)**

Sources in study area: Mine based raw materials; combustion of leaded gasoline in piston engine, bricks and cements factories.

Health Impacts: Damages the developing nervous system, resulting in IQ loss and impacts on learning, memory, and behavior in children. Cardiovascular and renal effects in adults and early effects related to anemia.
Ozone (O₃)

Sources in study area: NOx in the presence of sunlight.

Health Impacts: Decreases lung function and causes respiratory symptoms, such as coughing and shortness of breath and also makes asthma as well as lung diseases.

Benzene

Sources: Outdoor air may contain low levels of benzene. Potential sources are from tobacco smoke, motor vehicle exhaust, and industrial emissions.

Health Impacts: The major effect of benzene from long-term exposure is on the blood. (Long-term exposure means exposure of a year or more.) Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells, leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Mercury

Source: Mercury emissions in the atmosphere account from burning of coal as well as lime stone based cement industries.

Health Impacts: The major health impact due to mercury is that it affects the central nervous system of human beings and affects the activities and functions of the brain.

3.3 Sample collection and analysis

TSP, PM₁₀, Hg and Pb

Equipment Used: High Volume Sampler from SIBAT CO, Japan and NESS lab for Lead and Mercury

48 hours sampling was carried out by maintaining suction flow rate at 180 liter/ minute. In an average 676,800 liter of air was taken during 24 hours of monitoring. Filters were changed after 24 hours. Air particulate matter with greater than 10 µm size and less than 10 µm size were collected on two different filter papers- perforated ad non perforated fitter once, from which TSP and PM 10 were measured. The particulate matters were collected on the Glass Fiber Filter paper (size 110 mm made by Sibata Co., Japan). Both filter papers, containing TSP and PM10 from air sampling was treated with nitric acid for the analysis of Pb, Cr and Hg (from total suspended particulate), which was measured using Atomic
Absorption Spectrophotometer. This test was performed at the NESS Laboratory in Kathmandu.

**PM$_{2.5}$**

Equipment used for 1st monitoring: SKC Pump with cyclones and UCB

The gravimetric 2.5 samples were collected using a BGI triplex cyclone (sc1.062, Waltham, MA) equipped with a 37-mm diameter filter (pore size 5 µm) at a flow rate of approximately 2 l/min. The pump was calibrated prior to and after each sampling period using a rotameter. For gravimetric sampling, all filters weighed (pre and post weighing) in the air pollution lab of University of California using millet balance (7 digits after 0). All filters were conditioned for at least 24 hours in a temperature and humidity controlled room before weighing. The temperature inside the controlled room was maintained between 17 and 23°C and the Relative Humidity (RH) maintained below 42%. During the weighing, polonium 210 alpha source stripes used to eliminate interference of electrostatic charges on filter. The lab filters weighted before every weighing session to compare the weight measured during the session to the historically available measurements. Each time (pre and post weighing session), filters weighed three times and average values used to calculate the mass.

UCB used to generate PM$_{2.5}$ time series data during the first monitoring. The UCB particle monitor is a small, light, passive, battery-operated, (particle) data logger developed at UC Berkeley. Along with particles, UCB monitor also continuously measure temperature and humidity. The UCB monitor contains two sensor chambers, the photoelectric (optical scattering by airborne particles) and ionization (ion depletion by airborne particles). For the purpose of this study, only data collected using photoelectric chamber reported. The photoelectric chamber is the most sensitive to monitor PM$_{2.5}$. This chamber uses a light-emitting diode with and output wavelength of 880 nm and a photodiode that measures the intensity of scattered light at an angle of 45$^0$ from the forward direction. As light-scattering efficiency is a function of particle size and color.

Equipment used for 2nd monitoring: E- Sampler

PM$_{2.5}$ was monitored during 2nd monitoring by E-Sampler, Continuous Ambient Particulate Matter Monitor by Met One, U.S.A. This sampler was battery as well as electric operated and can shift from electricity to battery automatically. The samplers have an in-built USB Flash memory based data logger that records Filter ID, air temperature, filter temperature,
barometric pressure, flow rate, Coefficient of Variation (CV) and also totalizes and records the volume of air sampled. APC based software is provided to download the data for audit and prepare an intelligent report highlighting all important information in a convenient graphical format. The information generated entered and saved in a suitable statistical software package. The sampler has been calibrated with SKP pumps.

**Carbon Monoxide (CO)**

Equipment Used : ToxiRAE Pro sampler, California, USA

For the measurements of CO, QRAE II continuous Multi-gas Detector Diffusion Monitor developed by RAE System, USA was used. This monitor use electrochemical sensors and provides every minute data. Zero calibration was done prior to and after each sampling period by putting the monitor in particle and CO gas free air tight ziploc bag. The collected data were downloaded in computer after completion of monitoring period.

**SO₂, NO₂, B₂ and O₃**

Equipment Used: Passive Sampler from Gradko International LTD, Hampshire, USA

The samplers were placed middle of building to avoid the possibility of sampling stagnant air. The storage temperature was maintained in 20°. Sample identifier applied in the oblong space at the back of the sampler. The samples were fixed on to a suitable post using table to avoid mousier contamination. The cap of sampler was removed and exposed for 24 hours each. At the end of exposure period, cap was replaced, labeled with barcode and stored in a ziploc bag. Samples were returned to the US for lab analysis maintaining the temperature with data record sheet. Analyses of exposed tubes were carried out by Ion Chromatography (ISO Accredited Methods).
4. RESULTS AND ANALYSIS

4.1 Results of 1st monitoring (6th - 8th January)

The minimum temperature was recorded 6°Celsius (C) and maximum of 14°C in 1st day and minimum temperature was 8°C and maximum of 18°C during the 2nd day of study. Result of the first monitoring has been tabulated in the following manner.

Table: 1 Result of 1st Monitoring

<table>
<thead>
<tr>
<th>Air Pollution Parameters</th>
<th>National Standard</th>
<th>Result of Day 1</th>
<th>Result of Day 2</th>
<th>48 hour avg. concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSP</td>
<td>230 µg/m³</td>
<td>568µg/m³</td>
<td>532µg/m³</td>
<td>550 µg/m³</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>120 µg/m³</td>
<td>273µg/m³</td>
<td>256µg/m³</td>
<td>264.5 µg/m³</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>40 µg/m³</td>
<td>209µg/m³</td>
<td>97µg/m³</td>
<td>153 µg/m³</td>
</tr>
<tr>
<td>SO₂</td>
<td>70 µg/m³</td>
<td>14.25µg/m³</td>
<td>14.25µg/m³</td>
<td>14.25 µg/m³</td>
</tr>
<tr>
<td>NO₂</td>
<td>80 µg/m³</td>
<td>4.35µg/m³</td>
<td>3.86µg/m³</td>
<td>4.11 µg/m³</td>
</tr>
<tr>
<td>CO</td>
<td>10,000 µg/m³</td>
<td>5400 µg/m³</td>
<td>5400 µg/m³</td>
<td>5400 µg/m³</td>
</tr>
<tr>
<td>Pb</td>
<td>0.5 µg/m³</td>
<td>59µg/m³</td>
<td>60µg/m³</td>
<td>59.5 µg/m³</td>
</tr>
<tr>
<td>O₃</td>
<td>5 µg/m³</td>
<td>105µg/m³</td>
<td>92µg/m³</td>
<td>98.5µg/m³</td>
</tr>
<tr>
<td>Bz</td>
<td>157 µg/m³</td>
<td>81µg/m³</td>
<td>59 µg/m³</td>
<td>70 µg/m³</td>
</tr>
<tr>
<td>Hg</td>
<td>337.25 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cr</td>
<td>360 µg/m³</td>
<td>332.5 µg/m³</td>
<td>346.25 µg/m³</td>
<td></td>
</tr>
</tbody>
</table>

_Nepal doesn’t have its air pollution standard on Hg but it has a standard of 0.01mg/l on industrial waste water._
Analysis of dust particle pollution (PM$_{2.5}$ in general)

Chart: 1. Variation of PM$_{2.5}$ concentration in first 24 hours

Chart: 2. Variation of PM$_{2.5}$ concentration in second 24 hours

PM$_{2.5}$ value in sampling day one was higher than the national standard. It was noticed that people were burning fire for warming themselves in nearby areas but sampling day two was sunny. The trend of dust particles showed higher concentration during the night time (between 8:30 P.M and 12:30 A.M). Since people generally stop cooking around 8:00, the higher concentration after 9:30 till 12:30 could be due to cold temperature, while people use biomass and straw for heating purposes, and also may be due to the use of diesel generators for air condition in nearby hotels. Fluctuation data indicates interference by nearby sources, so
continuous monitoring of dust particles is needed there for at least a year to find out seasonal variation. However, concentration of dust particles was found lower during the visitors' flow time around 9 A.M., as per observation of monitoring team. Overall, dust pollution is higher than the national standard.

**Trend of Gaseous Contamination**

The gas concentration also showed similar trend, high during night time and relatively low in the morning and moderate during the day time. The concentration level of SO₂, NO₂ (except day 1) and CO is below the national standard it may because of the continuous rain during the field survey that may have fluxed away from the air and then afterwards it took some time for it to concentrate in air. There is need of depth study on meteorology part to find out the sources of gas pollution. The old vehicles as well as provision of running private vehicle up to the main gate also added to the moderate level of CO during day time in the region. Industries near to the site might have also great contribution of gaseous pollutant along with particulate matter.

**Pb, O₃, Benzene and Hg**

Concentrations of Lead, Ozone, Benzene on air were found high but some parameters were below the Nepal's standard. One of the reasons behind may be because of rain during and before the sampling time. Mine based raw materials such as uses of coal, lime based cement industries and trans boundary movement of pollutants could be its sources because this area is close to Indian state of Utter Pradesh and lot of development as well as industrial activities were being carried out in that area. Therefore, due to trans boundary movement of the pollutants could be dispersed from those adjoining areas.
Comparison of pollutants with Nepalese Standard

Chart 3. Comparison of TSP with Nepal Standard

Chart 4. Comparison of PM$_{10}$ with Nepal Standard

Chart 5. Comparison of PM$_{2.5}$ with Nepal Standard

Chart 6. Comparison of SO$_2$ with Nepal Standard
Chart 7. Comparison of NO\textsubscript{2} with Nepal Standard

Chart 8. Comparison of CO with Nepal Standard

Chart 9. Comparison of Pb with Nepal Standard

Chart 10. Comparison of O\textsubscript{3} with Nepal Standard
4.2 Results of 2\textsuperscript{nd} monitoring (9\textsuperscript{th} - 11\textsuperscript{th} March)

The minimum temperature was recorded 9\textdegree Celsius (C) and maximum of 18\textdegree C in 1\textsuperscript{st} day and minimum temperature was 11\textdegree C and maximum of 17\textdegree C during the 2\textsuperscript{nd} day of study the result of the 2\textsuperscript{nd} monitoring was also tabulated in the following manner.

Table: 2 Result of 2\textsuperscript{nd} Monitoring

<table>
<thead>
<tr>
<th>Air Pollution Parameters</th>
<th>National Standard</th>
<th>Result of Day 1</th>
<th>Result of Day 2</th>
<th>48 hr. avg. concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSP</td>
<td>230 µg/m\textsuperscript{3}</td>
<td>293µg/m\textsuperscript{3}</td>
<td>296µg/m\textsuperscript{3}</td>
<td>294.5 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>PM \textsubscript{10}</td>
<td>120 µg/m\textsuperscript{3}</td>
<td>176µg/m\textsuperscript{3}</td>
<td>181µg/m\textsuperscript{3}</td>
<td>178.5 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>PM \textsubscript{2.5}</td>
<td>40 µg/m\textsuperscript{3}</td>
<td>40µg/m\textsuperscript{3}</td>
<td>43µg/m\textsuperscript{3}</td>
<td>41.5 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>70 µg/m\textsuperscript{3}</td>
<td>11µg/m\textsuperscript{3}</td>
<td>13µg/m\textsuperscript{3}</td>
<td>12 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>NO\textsubscript{2}</td>
<td>80 µg/m\textsuperscript{3}</td>
<td>37µg/m\textsuperscript{3}</td>
<td>17 µg/m\textsuperscript{3}</td>
<td>27 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>CO</td>
<td>10,000 µg/m³</td>
<td>3760 µg/m³</td>
<td>3760 µg/m³</td>
<td>3760 µg/m³</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Pb</td>
<td>0.5 µg/m³</td>
<td>60 µg/m³</td>
<td>60 µg/m³</td>
<td>60 µg/m³</td>
</tr>
<tr>
<td>O₃</td>
<td>5 µg/m³</td>
<td>113 µg/m³</td>
<td>125 µg/m³</td>
<td>119 µg/m³</td>
</tr>
<tr>
<td>Bz</td>
<td>157 µg/m³</td>
<td>31 µg/m³</td>
<td>30 µg/m³</td>
<td>30.5 µg/m³</td>
</tr>
<tr>
<td>Hg</td>
<td>-</td>
<td>-</td>
<td>385 µg/m³</td>
<td>385 µg/m³</td>
</tr>
</tbody>
</table>

*Nepal doesn’t have its air pollution standard on Hg but it has a standard of 0.01mg/l on industrial waste water.*

1. Trend of dust particles pollution

![Chart 11: variation of PM$_{2.5}$ in the first 24 hours](chart11.png)

![Chart 12: variation of PM$_{2.5}$ in the second 24 hours](chart12.png)
The two figures shown above depict the trend of the variation of PM$_{2.5}$ concentration during the two days of sampling. Both figures show a similar pattern with peak values occurring during the morning hours may be due to movements of tourist vehicles and other activities with a dip during the afternoon hours. The concentrations remain relatively constant during the night hours, which indicate its continuous source.

2. Trend of Gaseous pollutants

The gases contamination during second monitoring was low. All parameters are below the standard.

3. Pb, O$_3$ and Hg pollutants

Concentration of Pb, O$_3$ and Hg are high due to burning of coal in brick, brick tiles and lime based cement industries from Nepal as well as Indian State of Utter Pradesh, which is 7 km far from boundary of Mayadevi temple so trans boundary movement could be also its root cause.

Comparison of pollutants with Nepalese Standard
Chart 15: Comparison of PM$_{2.5}$ with Nepal Standard

Chart 16: Comparison of SO$_2$ with Nepal Standard

Chart 17: Comparison of NO$_2$ with Nepal Standard

Chart 18: Comparison of CO with Nepal Standard
Chart 19: Comparison of Pb with Nepal Standard

Chart 20: Comparison of O₃ with Nepal Standard

Chart 21: Comparison of Benzene with Nepal Standard
4.3 Comparison of 48 hr. average concentration between pre- and post-winter monitoring (i.e. Monitoring I and Monitoring II)

Table: 3 Comparison of the pollutants against the Nepal standards

<table>
<thead>
<tr>
<th>Air Pollution Parameters</th>
<th>National Standard</th>
<th>Average Result of 1st Monitoring</th>
<th>Average Result of 2nd Monitoring</th>
<th>Average concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSP</td>
<td>230 µg/m³</td>
<td>550 µg/m³</td>
<td>294.5 µg/m³</td>
<td>422.25 µg/m³</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>120 µg/m³</td>
<td>264.5 µg/m³</td>
<td>178.5 µg/m³</td>
<td>221.5 µg/m³</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>40 µg/m³</td>
<td>153 µg/m³</td>
<td>41.5 µg/m³</td>
<td>97.25 µg/m³</td>
</tr>
<tr>
<td>SO₂</td>
<td>70 µg/m³</td>
<td>14.25 µg/m³</td>
<td>12 µg/m³</td>
<td>13 µg/m³</td>
</tr>
<tr>
<td>NO₂</td>
<td>80 µg/m³</td>
<td>4.11 µg/m³</td>
<td>27 µg/m³</td>
<td>16 µg/m³</td>
</tr>
<tr>
<td>CO</td>
<td>10,000 µg/m³</td>
<td>5400 µg/m³</td>
<td>3760 µg/m³</td>
<td>4580 µg/m³</td>
</tr>
<tr>
<td>Pb</td>
<td>0.5 µg/m³</td>
<td>59.5 µg/m³</td>
<td>60 µg/m³</td>
<td>60 µg/m³</td>
</tr>
<tr>
<td>O₃</td>
<td>5 µg/m³</td>
<td>98.5 µg/m³</td>
<td>119 µg/m³</td>
<td>108.75 µg/m³</td>
</tr>
<tr>
<td>Bz</td>
<td>157 µg/m³</td>
<td>70 µg/m³</td>
<td>119 µg/m³</td>
<td>95 µg/m³</td>
</tr>
<tr>
<td>Hg</td>
<td>-</td>
<td>337.25 µg/m³</td>
<td>385 µg/m³</td>
<td>361 µg/m³</td>
</tr>
</tbody>
</table>

*Nepal doesn’t have its air pollution standard on Hg but it have standard of 0.01mg/l on waste water.*

4.3.1 Comparative Analysis of Particulates Pollutions

The results obtained indicate that the pollutants remain in relatively lower concentrations during the post-winter phases. This has been clearly seen in the case of TSP where the pollutants decreased by as much as 47% and also in the cases PM₁₀ where the pollutants decreased by 33%. The most significant decrease has been seen in the case of PM₂.₅ where the pollutants decreased by as much as 73% during the post-winter phase.
4.3.2 Comparative Analysis of Gases Pollutants

The similar trend like dust partials pollution has been seen for gaseous pollutants, where the concentrations have been found to be relatively low during the post-winter phases. An exception here is the case of Nitrogen Dioxide, where the concentrations have increased by almost 7 folds. This is clear, due to the fact that during the winter season, fuel combustion is increased, be it in the use of heaters, or generators or boilers; and fuel combustion is a major contributor of NO$_2$ in the atmosphere. However, the concentrations are way lower than the National Standard.

4.3.3 Comparative Analysis of Benzene, Lead, Mercury and Ozone

The level of Benzene found lower than the national standard. This study also pointed parameters of Lead, Mercury and Ozone are high in both seasons, which indicated its regular sources. Mine based industries or mine based raw materials are its major sources. Article 8 of Minamata convention added coal fire plants and clinker based cement industries as the major contributors these pollutions. According to UNESCO/ IUCN study report, there are four Cement Industries produce Clinker in B-L road with production capacity of 1800 mt/ day, which draws the attention towards its source. Similarly burning coal in large number of bricks and brick tile industries could be another source of such pollutants. Use of lead in raw materials of iron, steel industries should somehow contribute its pollution on air. According WIKIPIDIA, coal contributes 59% source of electricity generation in India and its installed capacity, 271.722 Giga Watt (GW). Beside it, India is second largest bricks producer in the world after China and its state of Utter Pradesh, is one of the major bricks producer, which adjoins the boundary of Lumbini area. Therefore, the Trans boundary movement of air could be the major threats to increase these parameters. Thus the study tem would like to suggest further detailed study to find out root causes of these pollutions in future.
Findings of pollutants with Nepalese standard

Chart 22: Comparison of TSP with Nepal Standard

Chart 23: Comparison of PM$_{10}$ with Nepal Standard

Chart 24: Comparison of PM$_{2.5}$ with Nepal Standard

Chart 25: Comparison of SO$_2$ with Nepal Standard
Chart 26: Comparison of NO₂ with Nepal Standard

Chart 27: Comparison of CO with Nepal Standard

Chart 28: Comparison of Pb with Nepal Standard

Chart 29: Comparison of O₃ with Nepal Standard
4.4 Other findings

The dust particle of Lumbini looks like brown colour compared to Putalisadak, Kathmandu, where vehicle pollution is the major source of air pollution. It indicates that mix of ash and emission from different sources such as industries, vehicle, coal burning and generators are the main source of air pollution at Lumbini. Level of TSP and PM$_{10}$ are two times higher than national standard but lead and PM$_{2.5}$ concentrations are about 100 and 2.5 times higher than national standard and its potential sources are given below.

Most of factories that produced dust emissions, especially in materials handling, transfer points of materials, packing of products and transportation could increase level of TSP and
P.M\textsubscript{10}. Most of them have not adopted the practice of greenbelt and regular water sprinkling to reduce the impact of dust emissions. Beside that the number of brick industries is quite high and it burns coal that causes ash also contributes for these parameters. Although, these cement and bricks industries are at least 6.5 km and 2.5 km far from main temple but there is the presence of bordering Indian state of Uttar Pradesh with huge number of brick industries as well as coal burning practice for domestic purposes which is common in those areas. So trans boundary pollution could be another source for dust pollution. Surrounding roads conditions, entrance of vehicles inside the boundary and big capacity generators of hotels and temples nearby Mayadevi temple are also contributing to dust and emission that support the increase of PM\textsubscript{2.5}. The single lane road access form main road is also dusty and also the practice of burning rice husk as mosquito repellents is also the major sources of PM in this area. Besides this, lots of construction is going on within the protected area and its surrounding, which are adding to the PM level. The numbers of vehicle movement are increasing in this area so their contribution on PM level is also significant.

### 4.5 Potential source of air pollutants in Lumbini

- **Clinker-based cement**: Dust
- **Lime-based cement**: Dust, Hg, CO, NO\textsubscript{x}, SO\textsubscript{x}, Pb
- **Plywood**: Dust, Black carbon, CO
- **Paper**: Dust, CO, SO\textsubscript{x}, NO\textsubscript{x}, Black carbon
- **Nutrient food**: Dust
- **Hotels**: Generators Emission (CO, NO\textsubscript{x}, SO\textsubscript{x}, Pb, Black carbon)
- **Monasteries**: Generators Emission (CO, NO\textsubscript{x}, SO\textsubscript{x}, Pb, Black carbon)
- **Cars/ Jeeps Allowed entering Boundary wall area**: (CO, NO\textsubscript{x}, SO\textsubscript{x})
- **Construction and road Condition**: Dust

### 4.6 Existing Industries in Lumbini area and its distance from Mayadevi Temple

- Hotels: 12 hotels with air conditioning facilities, 3 within the boundary of Mayadevi temple and other are adjoining the boundary wall;
- Brick kilns: 42 factories, nearest distance of industry is 2.5 K.M from boundary wall of Mayadevi Temple;
• Cement and clinker production: 11 factories, nearest distance of industry is 6.5 K.M from boundary wall of Mayadevi Temple;

• Steel production: 2 factories, nearest distance of industry is 6.5 K.M from boundary wall of Mayadevi Temple;

• Noodles production: 1 factory in distance of 7.14 K.M from boundary wall of Mayadevi Temple;

• Paper production: 1 factory in 6.5 K.M distance of boundary wall of Mayadevi Temple;

• Flour production: 2 factories, nearest distance of industry is 7 K.M from boundary wall of Mayadevi Temple;

• Other products such as plywood, edible oil and sacks: 10 factories, nearest distance of industry is 8 K.M from boundary wall of Mayadevi Temple.

*Distance source: UNESCO/ IUCN study 2013*

### 4.7 Impact of Air pollution in Lumbini

Nepal’s standard is higher than the WHO guidelines and there are few studies conducted on air pollution and its impact in health in Nepal. The current status of air pollution in Lumbini could make adverse impacts on ecosystems, decay of building materials and paints, statues, and monuments, visibility impairment, reduced agricultural production. It could damage its most important monuments in the sacred garden of Lumbini—namely the Marker Stone, the Nativity Sculpture, and the Asoka Pillar. Since SOx, NOx causes acid rain which is very corrosive and degrades the limestone, marble, and metals of ancient sculptures and monuments. Increasing of air polluting substances (particulate matter and other pollutants) emitted by the different sources will damage the Lumbini Ashoka pillar with its inscription and the archaeological remains at the World Heritage Site Lumbini and other archaeological sites rapidly. Besides it, such increase of air pollution could also cause the temperature rise and reverse impact of climate change causes loss of bio diversity and impact on livestock. In India in 2014, it was reported that air pollution had cut crop yields in the most affected areas by almost half in 2010 when compared to 1980 levels.
It is difficult to analyze the relation between level of air pollution and its health impact. Current PM emission in Lumbini can be declared as a leading environmental cause of respiratory diseases as well as cancer deaths in long term. Tourists and pilgrims visiting Lumbini could be affected by early morning fog, observed in the sacred garden, which is actually smog. Local people and Buddhist monks and nuns living in Lumbini are unknowingly taking in this polluted air during their daily routine and while practicing yoga and meditation.

The development of monasteries and infrastructure, commercial and industrial activities and increasing population, particularly visitors, have also contributed to the increase in waste generation at the world heritage site. Furthermore, the increase in number of visitors after the completion of the ongoing international airport in Bhairahawa will generate more waste and will have serious adverse impacts in future, if an efficient waste management system is not timely established.

5. RECOMMENDATIONS

Therefore, the study team would like to suggest following recommendations to control the air pollution in this area based on its observations and finding of the result:

1. An air-pollution free area in the region could be declared by using renewable energy sources in the hotels, monasteries and households of LPZ to minimize use of fossil fuel.

2. Entrance of vehicles within boundary area of Mayadevi Temple, which is contributing to PM$_{2.5}$ concentrations need to be replaced with environment friendly vehicles.

3. Road up to main gate from B-L road should be at least double lane, black topped and green belt in BLR need to be maintained properly, which is decreasing due to road expansion work.
4. Somehow, industries and construction sites are contributing for dust emission so it could adopt best practices as dust control measures that includes:
   - The sprinkling of water along internal roads in the plant.
   - Raw materials loading and unloading should be done in the covered area and it could be stored in a covered structure. All the conveyors need to be provided with a conveyer cover.
   - The green belt should be developed around the plant to arrest the fugitive emissions.

5. For continuous monitoring of all parameters of air pollution, as defined by National Ambient Air Quality Standard, a permanent air Quality monitoring station should be established. On the basis of the data, detail analysis of air pollution and its impact on the environment of Lumbini as well as its health impact should be carried out.

6. Nepal government should focus on compliance monitoring for the implementation of pollution control measures, environmental standards, directives and decisions of Industrial Promotion Board in the industries of Lumbini area.

7. The level of Lead, Mercury and Ozone concentration found quite high on air so there is need of further study on these parameters to trace out it sources, which this study could not complete due to its resources limitations. Similarly Trans Boundary pollution should be studied to ascertain the contribution of it in overall air pollution of Lumbini.

8. Awareness programs could be conducted to impart knowledge to the community through environmental education, campaigns, workshops etc. to minimize air pollution level from household level.

9. The old and polluting vehicles should be replaced by newer and preferably eco-friendly vehicles and implementation of sticker system in the vehicles plying in this area could help significantly in reducing air pollution.

10. The fuel mixing and fuel adulteration needs to be controlled to minimize pollution from vehicle and generator (as it is the major source of energy in many industries).
11. The 15 KM boundary is yet to be demarked, so it should be done immediately so that the board's decision could be fully implemented resulting in reducing air pollution.

Long term

1. Environmentally friendly (non-carbon emitting) industries could only be allowed in Bhairawa Lumbini corridor and within 15 KM area of Lumbini to maintain the pristine environment in Lumbini.

2. Polluting industries operating in the area should be screened based on detail study, and such industries should be transferred from that location even by providing appropriate incentives to the entrepreneurs, if necessary.

3. The monasteries, hotels and others should only be allowed to use alternative energy source. Also government should incentivize and pursue them for shifting towards cleaner technology.

4. The “polluter pays principle” should be implemented and culprits should be punished. Tax collected by virtue of this principle should be utilized by creating a separate fund which could be used for the pollution control and safeguard the environment of Lumbini.

5. To minimize the effect of Tran boundary movement of air pollution in Lumbini, Nepal Government should initiate dialogue with the neighboring countries, for conducting bilateral as well as multilateral program, for mitigation of air pollution, among the SAARC countries.

6. A full automated real time air Quality monitoring station for measuring local as well as Trans Boundary air pollution should be established to ascertain the overall air pollution of Lumbini.

7. This area should be declared as a protected area due to its importance and its historical value.
6. REFERENCES

1. Decisions of Industrial Promotional Board, Nepal, meetings no. 190 and 197.
2. Impact of Air Pollution in human health, WHO.
5. www.wikipedia.org
6. www.lumbinitrust.org/