

**GOVERNMENT OF NEPAL
MINISTRY OF URBAN DEVELOPMENT
HIGH POWERED COMMITTEE FOR INTEGRATED
DEVELOPMENT OF THE BAGMATI CIVILIZATION
GUHESHWORI, KATHMANDU**

FINAL PROJECT REPORT ON
**Pre-feasibility study for Tukucha khola corridor management project,
Preliminary Design, Estimate, lighting arrangement, parking area,
landscaping and allied works along both bank of the Tukucha River
from Chandol to Bagmati Confluence at Kathmandu Metropolitan city.**

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ACKNOWLEDGEMENT

It is a matter of great pleasure that we, Bonafide Team, have an opportunity to present this final report **Pre-feasibility study for Tukucha khola corridor management project, Preliminary Design, Estimate, lighting arrangement, parking area, landscaping and allied works along both bank of the Tukucha River from Chandol to Bagmati Confluence at Kathmandu Metropolitan city.**

We would like to express our heartfelt gratitude and appreciation to all those who gave us an assistance to prepare this design. Our special thanks go to our staffs for their cordial support, generous behavior and for providing us relevant information.

We are extremely grateful to **High Powered Committee for integrated Development of the Bagmati Civilization (HPCIDBC)** which gave us the means to explore our capabilities.

Finally, we are indebted to all the stakeholders of HPCIDBC, Metropolitan chairperson, Survey Department and Ministry of Urban Development for providing us this opportunity.

EXECUTIVE SUMMARY

Tukucha river is one of the locally originated rivers in Kathmandu valley. This 5km long river has relatively small water flow in comparison to other river systems in Kathmandu valley and its width varies from 3m in the upstream region to upto 8m at some parts in the downstream region. The width of the river is not consistent as the river is subjected to encroachment at many places and also used to dump sewer lines.

This report highlights the present scenario of the exploitation of the river and proposes a new implementation plan to restore and preserve the river. The river is inaccessible at many parts, mainly due to settlements being built right to the river edge and many houses are in violation of the river setback bye-laws. This report aims to present the data to the concerned authorities at HPCIDBC and proposes a conceptual design that presents a version of Tukucha river free from squeezed spaces with walkways and cycle lanes at both sides of the river. At appropriate spaces, where large open areas are present, city parking, open parks, street markets and other facilities have been proposed. Such spaces are mainly designed at Narayanhiti Palace Museum, Ichchhumati Tarkari Bazar and Bhrikutimandap. Typical Open parks are also developed so as to utilize open spaces available.

From this approach, it will benefit pedestrians and cyclists and free them from the hassles of the urban traffic. It also benefits the adjacent houses and lands as well and provide them with a fresh environment amidst the crowded city. This report provides the fundamental ideas and concepts so as to overhaul the current river scenario and transform into a beautiful yet purposeful river corridor.

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1. Overview of the Study

1.1. Study Background

Tukucha, also known as Ichhumati, is one of those heavily polluted tributaries to the Bagmati River. It joins the Bagmati at Kalmochanghat, Thapathali. It hosts several schools, university campuses, banks, administration buildings, small commercial units and private houses. Most of them are connected to sewerage systems that drain to Tukucha Khola directly. In the absence of appropriate sewage collection and waste water treatment plants, the tukucha khola has become an open sewage drain. The river sides have been extensively encroached by squatters, residential buildings and road construction. In some stretches such as Durbar Marg and Kamaladi, the river flows underneath the buildings. The entire stretch of the river has been used for dumping solid waste and waste water into the river. Bhatbhateni temple, Nil Saraswati and Tundal Devi are important religious sites located along this river and these sites are well preserved. The **High Powered Committee for Integrated Development of the Bagmati Civilization** strives to change this situation and re-establish on the long term the river's previous beauty respecting its historic, cultural and religious role in the life of the people.

River corridor is most probably the only open space left in the city core areas of Kathmandu valley, although the environmental condition is very poor. The unmanaged sewerage connections, solid waste dumping and development of uncontrolled squatter settlements along the river banks have deteriorated the environmental conditions and hence has affected not only the aesthetic value but also the economic opportunity of the land alongside the river corridor. The open space and the river which could have been an asset to the urban areas of the city has been left neglected and polluted. Encroachment of land by the squatter settlements is on the rise. There is predominant encroachment of land adjacent to the river, by the people due to the vague demarcation of river boundary and water way width. Hence the entire river corridor is in a chaotic state. However, with proper planning and efficient implementation strategies this chaotic scenario can be changed. There are a lot of opportunities amidst the prevalent threats and a lot of strengths amidst the weaknesses which needs to be analysed.

The HPCIDBC is concerned to improving the current status of the Tukucha khola and preserve its boundaries and add to the beauty of the river flowing through the inner city. The HPCIDBC has signed an agreement with consultant (**Bonafide Engineering Consultancy Pvt. Ltd.**) for conducting Pre-feasibility study of Tukucha Khola corridor management project, Preliminary Design, Estimate, lighting arrangement, parking area, landscaping and allied works along both bank of the Tukucha River from Chandol to Bagmati Confluence.

1.2. Objective of the study

The primary objective of this project is to study the existing status of the Tukucha Khola and propose a plan to establish corridor on the both banks of the river along the river alignment, identify pocket spaces wherein vehicle parking, public parks, public toilets, markets and other facility could be developed and propose a preliminary design.

1.3. Scope of Work

- a. Collecting aerial photos, satellite images, cadastral and other types of maps available for Tukucha.
- b. Field assessment and preparation of Topographical map as well as GIS map.
- c. Overlay the cadastral map, satellite image over topographical map
- d. Identifying and creating database of land parcels and infrastructures within entire stretch of Tukucha Khola
- e. Preliminary Design and Preparation of Preliminary Cost Estimate of river corridor, River training, lighting arrangement, parking area, landscaping and allied works.
- f. Preparation of 3D models of proposed activities.

2. Basic Route Information

2.1. Study Area and Features

LOCATION:

GPS Location Extent :

Tundal Devi Mandir - 27°43'34.36"N,
85°20'8.36"E

Bagmati Dovan - 27°41'27.76"N, 85°18'52.13"E

The Region targeted by the study is a corridor having a length of approximately 5 km that runs through the core of the city including areas like Bhrikutimandap and Narayanhiti Palace Museum. Because of unmanaged and unmonitored state of the river, many places of the river are subjected to encroachment, violation of bye-laws and in some areas, the river has been buried underneath roads and buildings.

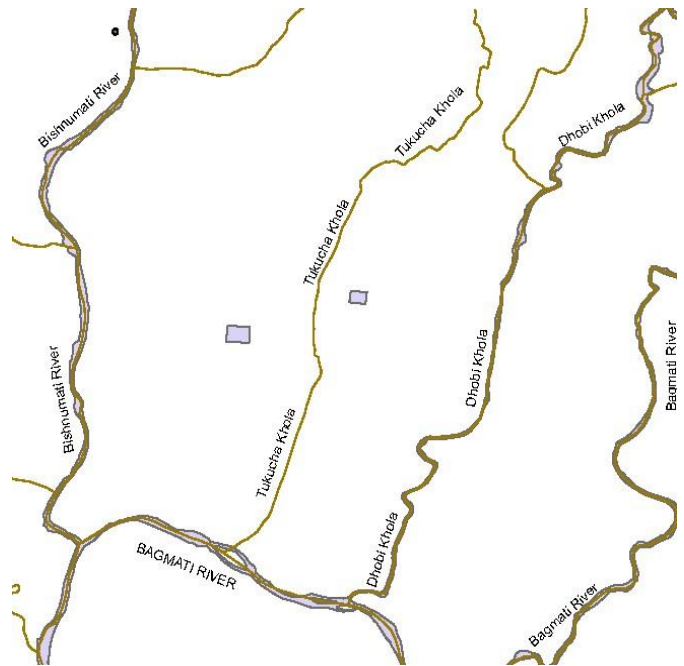


Figure 1 River Network - Kathmandu Valley

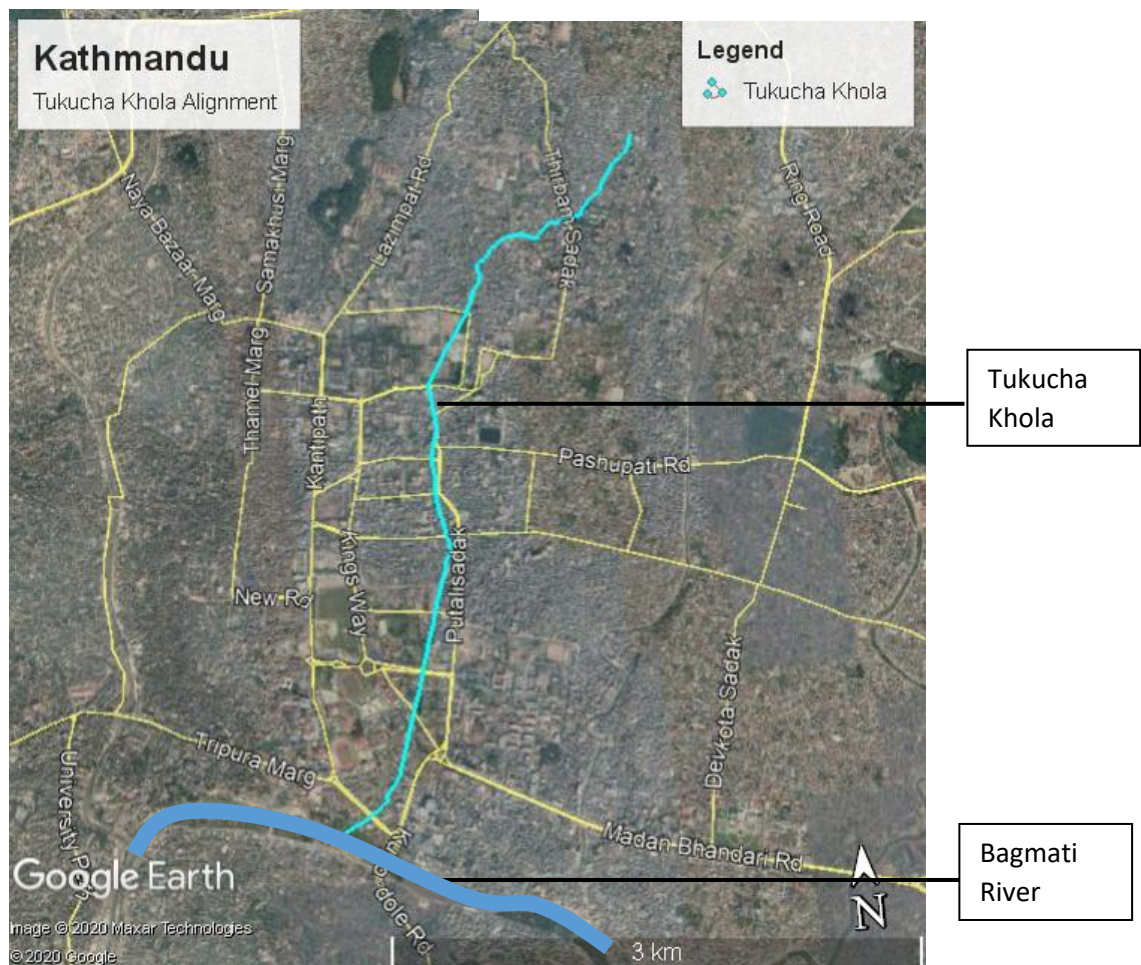


Figure 2 Google Earth Image - Tukucha khola

3. Site Analysis

Site visits and survey were conducted to assess the current status of the river throughout the length of the river. Drones were used to assess at most parts except the restricted zones like Embassy of People's Republic of China, Narayanhiti Palace Museum and Bhadrakali Army area. Necessary permission from concerned authority were taken before flying the drone.

For the study, the length of the river has been sub divided into ten segments on the basis of the nature of the location.

S. N	Segment ID	Location		GPS	
		From	To	From	To
1	Segment I	Tundal Devi Temple	Embassy of People's Republic of China	27°43'34.36"N, 85°20'8.36"E	27°43'19.36"N, 85°19'52.86"E
2	Segment II	Embassy of People's Republic of China	Gairidhara	27°43'19.36"N, 85°19'52.86"E	27°43'2.77"N, 85°19'28.58"E
3	Segment III	Narayanhiti palace museum		27°43'2.77"N, 85°19'28.58"E	27°42'49.34"N, 85°19'18.67"E
4	Segment IV	Narayanhiti palace museum	Teendhara Marg	27°42'49.34"N, 85°19'18.67"E	27°42'34.88"N, 85°19'18.02"E
5	Segment V	Teendhara Marg	Bagbazaar Road	27°42'34.88"N, 85°19'18.02"E	27°42'20.09"N, 85°19'19.58"E
6	Segment VI	Bagbazaar Road	Adwait Marg	27°42'20.09"N, 85°19'19.58"E	27°42'11.36"N, 85°19'17.31"E
7	Segment VII	Tarkari Bazaar		27°42'11.36"N, 85°19'17.31"E	27°42'6.19"N, 85°19'15.33"E
8	Segment VIII	Bhrikutimandap Area		27°42'6.19"N, 85°19'15.33"E	27°41'56.14"N, 85°19'11.76"E
9	Segment IX	Bhadrakali Area		27°42'6.19"N, 85°19'15.33"E	27°41'45.38"N, 85°19'7.69"E
10	Segment X	Bhadrakali	Bagmati Dovan	27°41'45.38"N, 85°19'7.69"E	27°41'27.84"N, 85°18'52.25"E

3.1. Present Status of River

Segment I

- The first segment begins from Tundal Devi Temple to Embassy of People's Republic of China. The GPS Co-ordinate of the segment is given below,
- Starting Co-ordinates : $27^{\circ}43'34.02''\text{N}$, $85^{\circ}20'8.03''\text{E}$
- End Co-ordinates: $27^{\circ}43'19.36''\text{N}$, $85^{\circ}19'52.86''$
- Length of Segment : 780m

Obsevation and Findings

This segment is mainly residential with 6m wide road on the right side of the river flow direction and left side is subjected to encroachment at most of the parts by people. The river itself has been covered with slab and used as a sidewalk providing access to the road on the opposite side. Boundary walls have been constructed on the edge of the river and the setback space of 4m has been not followed in most parts. The river discharge is relatively small and due to covered slab above the river underlying state of the river could not be examined.

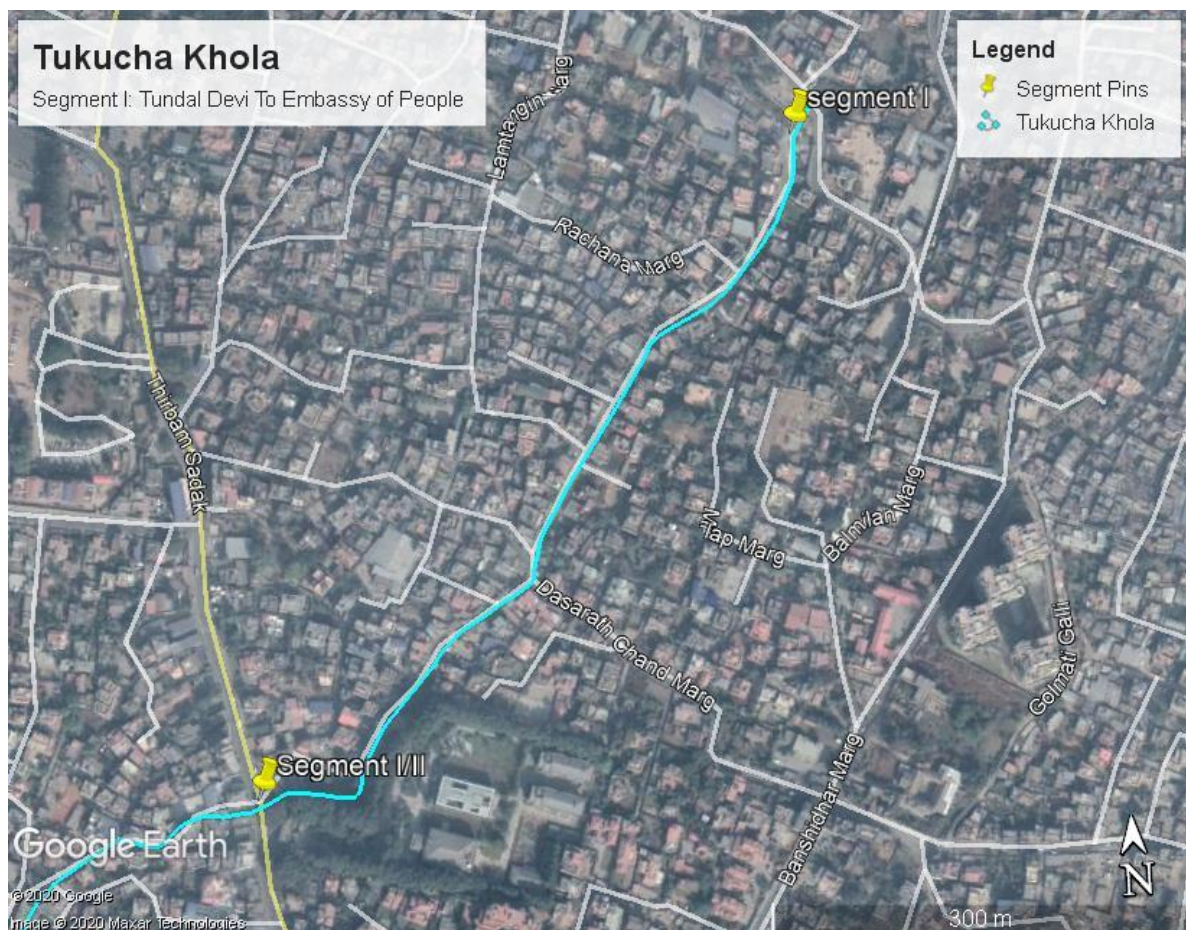


Figure 3 Segment I – Google Maps



Figure 4 Segment I - Tukucha Khola covered with Slab

Segment II

- The second segment begins from Embassy of People's Republic of China to Gairidhara (north of Narayanhiti Palace Museum). The GPS Co-ordinate of the segment is given below,
- Starting Co-ordinates : 27°43'19.36"N, 85°19'52.86"
- End Co-ordinates: 27°43'2.77"N, 85°19'28.58"E
- Length of Segment : 1000m

Observations & Findings

This segment is also mainly residential with 6m wide road on the left side of the river flow direction and right side is subjected to encroachment at most of the parts by people. At some portions of the length, river is covered by slab and used as a bridge to access the road. At some portions, the river is not accessible through either side and boundary walls have been constructed on the edge of the river and the setback space of 4m has not been followed in most parts. Neel Saraswoti Temple is located at the middle of the section and the river is also used for rituals at this site. Religious value is well established in this part of the river path. Drone is used to assess the inaccessible parts of the river path.

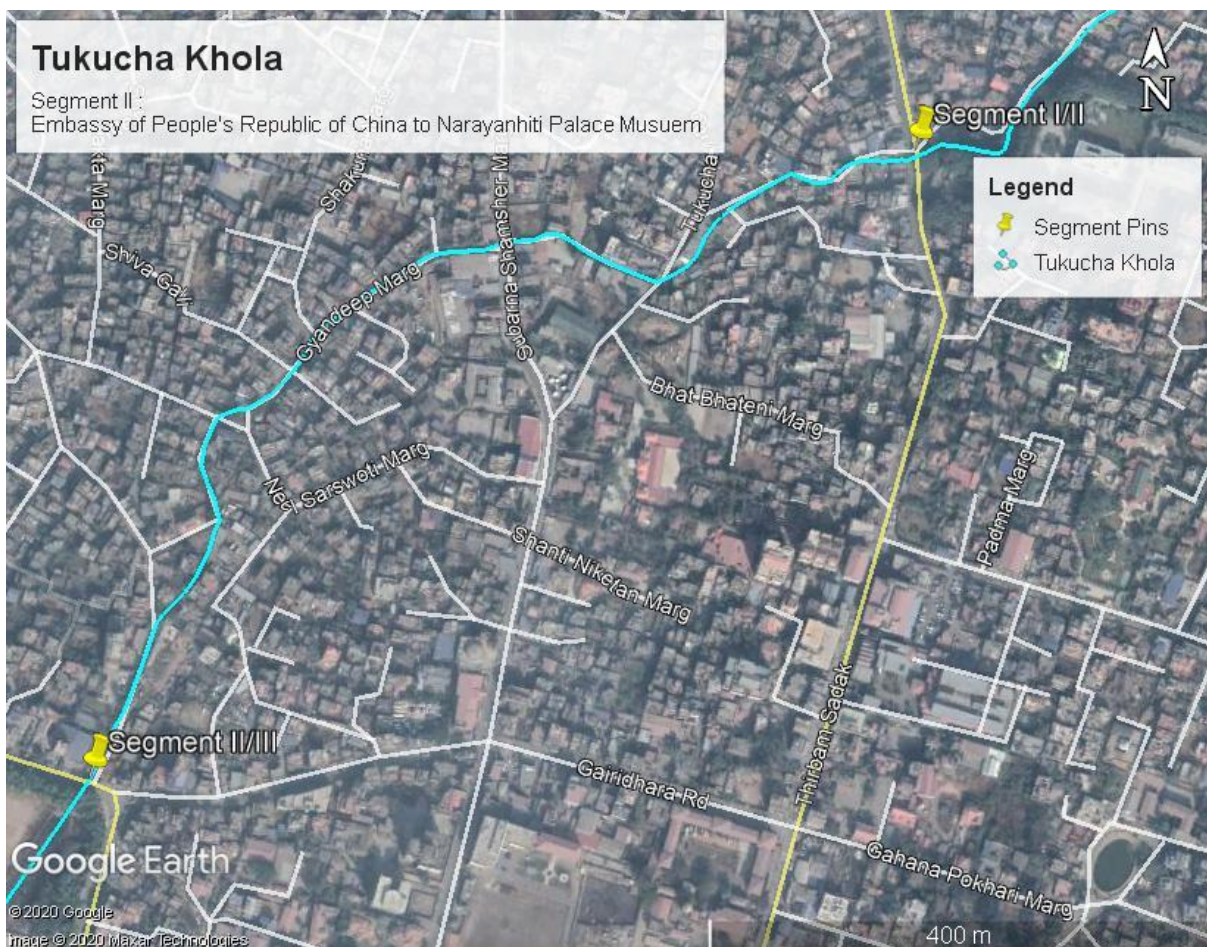


Figure 5 Segment III – Google Maps

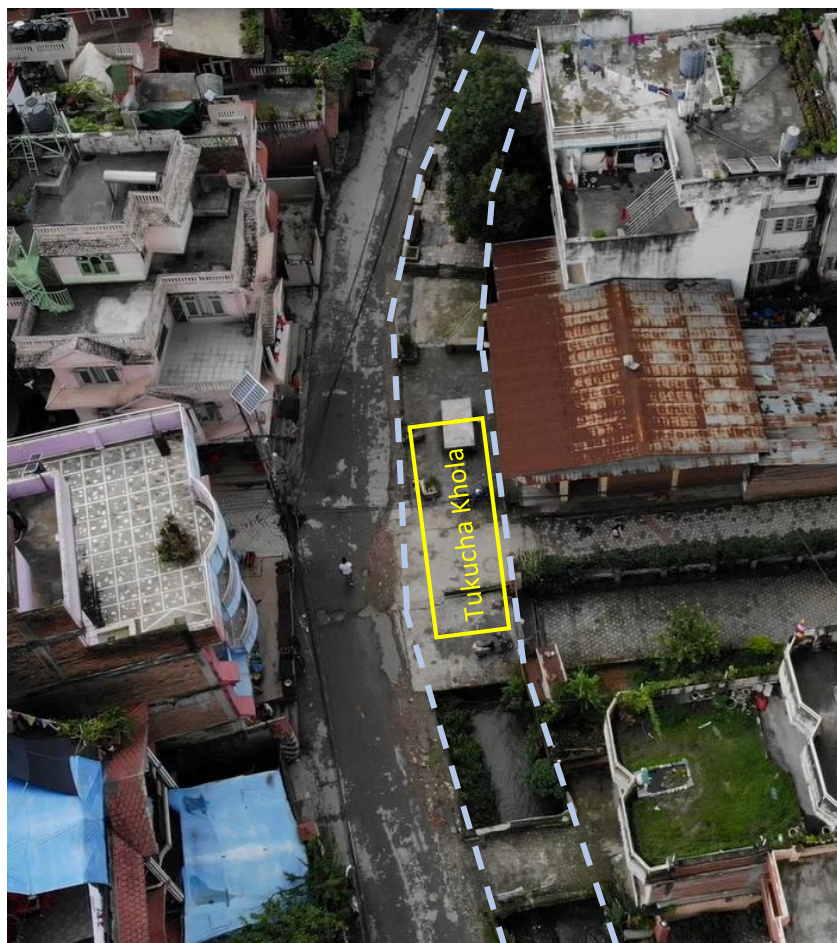


Figure 6 Segment II - Photos



Figure 7 Segment II - Photos

Segment III

- This segment passes through Narayanhiti Palace Musuem. The GPS Co-ordinate of the segment is given below,
- Starting Co-ordinates : 27°43'2.77"N, 85°19'28.58"E
- End Co-ordinates: 27°42'49.34"N, 85°19'18.67"E
- Length of Segment : 480m

Observations & Findings

This section passes through eastern portion of Narayanhiti palace museum with Republic Memorial Park on the left of the river flow direction. Drone images were not collected due to high level of restriction in this area. The river in this section seems to be protected as viewed from the satellite images. There is approximately 25,270sqm of free space available on the left of the river flow inside the Narayanhiti Palace Museum. These free spaces can be utilized for urban car parking area, parks etc.



Figure 8 Segment III – Google Maps

Segment IV

- This segment begins outside Narayanhiti Palace Musuem to Teendhara Marg.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : $27^{\circ}42'49.34''\text{N}$, $85^{\circ}19'18.67''\text{E}$
 - End Co-ordinates: $27^{\circ}42'34.88''\text{N}$, $85^{\circ}19'18.02''\text{E}$
- Length of Segment : 440m

Observations & Findings

Almost all the portion this section is buried underneath either road or buildings and the river is not accessible.

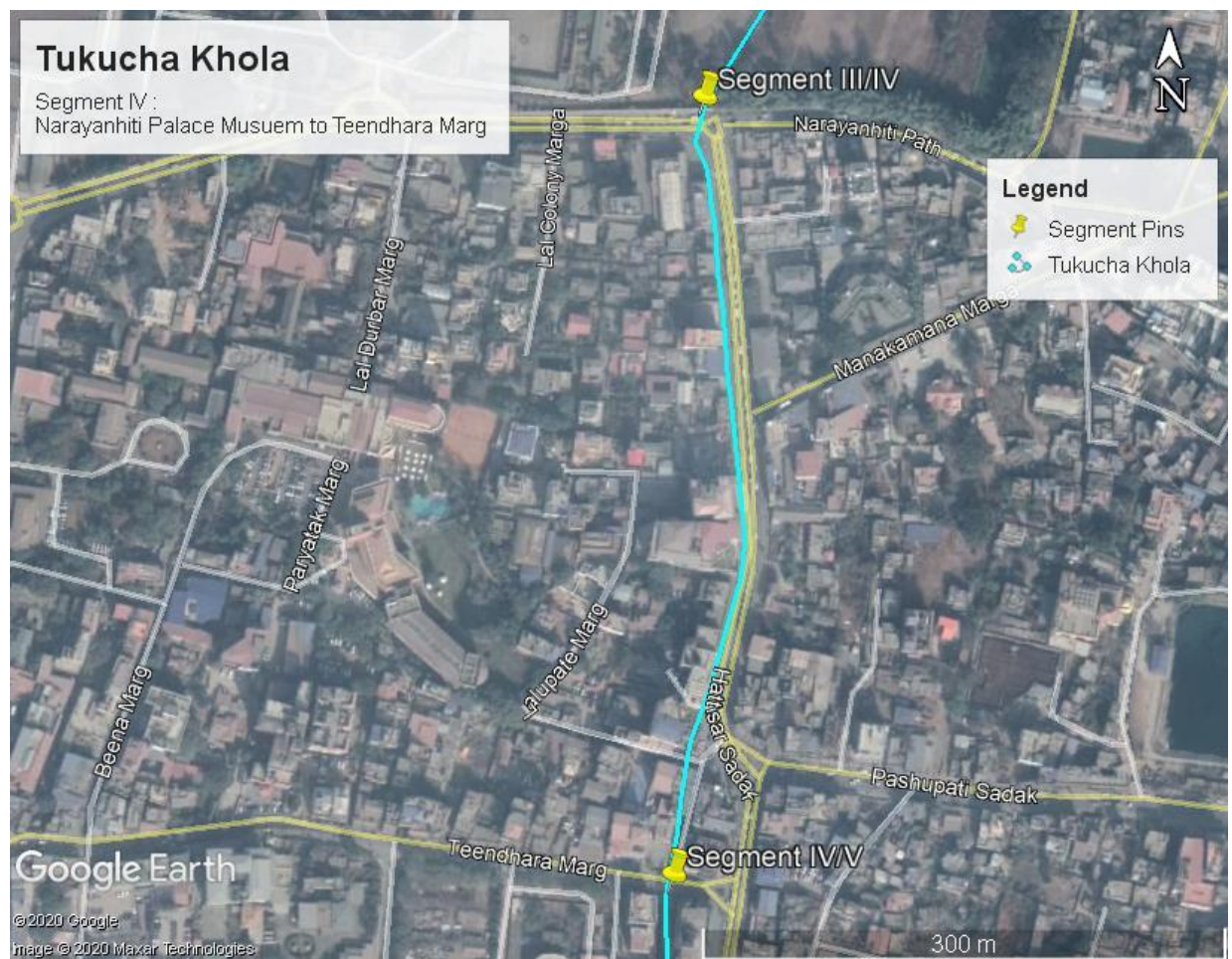


Figure 9 Segment IV – Google Maps

Segment V

- This segment begins from Teendhara Marg to Bagbazar road.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : $27^{\circ}42'34.88''\text{N}$, $85^{\circ}19'18.02''\text{E}$
 - End Co-ordinates: $27^{\circ}42'20.09''\text{N}$, $85^{\circ}19'19.58''\text{E}$
- Length of Segment : 465m

Observations & Findings

River is mostly visible in this section of the river. There are some open areas available in this section while some areas are densely built. The river banks are inaccessible due to buildings being built right to the edge invading the setback spaces.

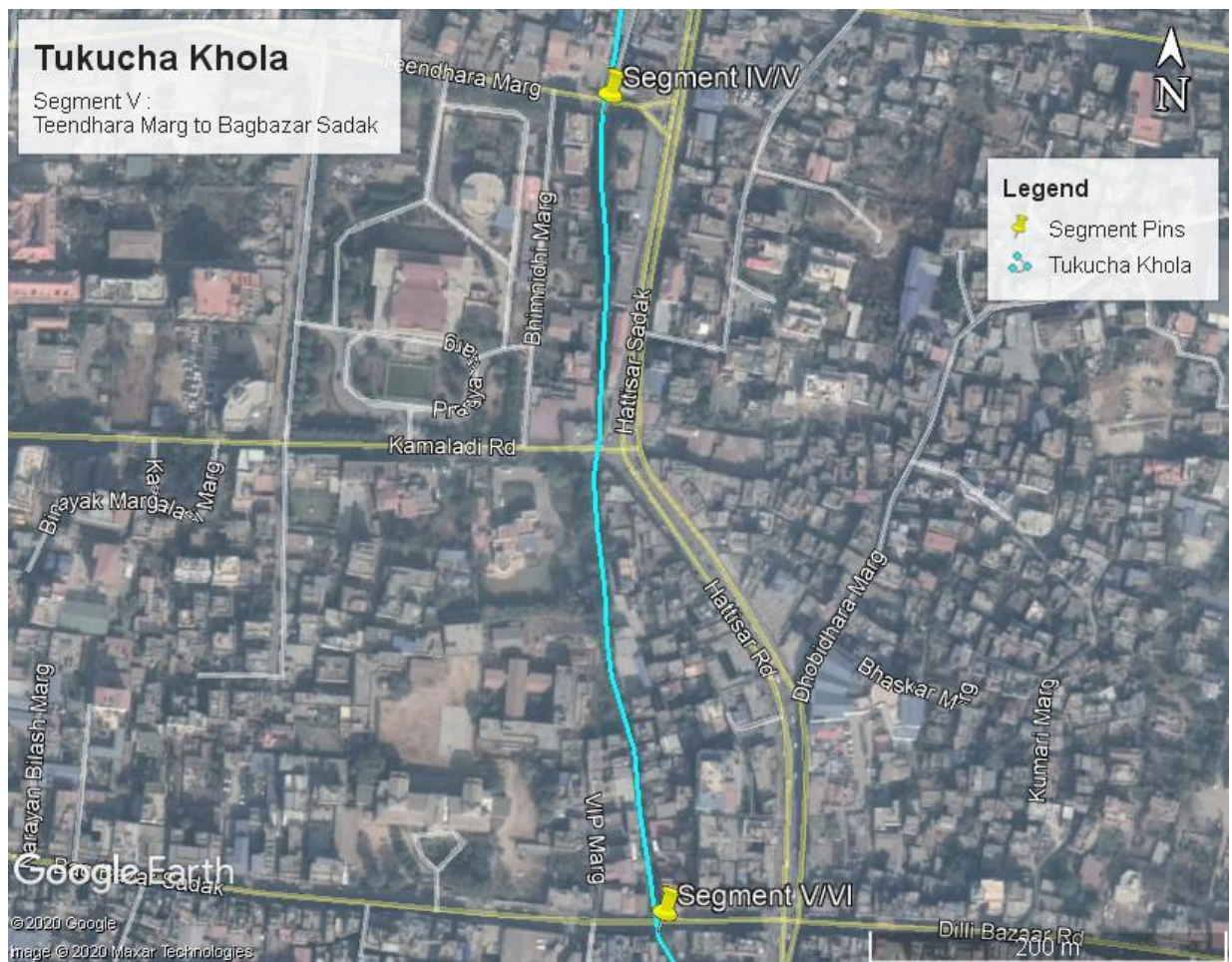


Figure 10 Segment V - Google Maps

Segment VI

- This segment begins from Bagbazar Road to Adwait Marg
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : 27°42'20.09"N, 85°19'19.58"E
 - End Co-ordinates: 27°42'11.36"N, 85°19'17.31"E
- Length of Segment : 280m

Observations & Findings

River is mostly visible in this section of the river but mostly inaccessible due to buildings being built right to the edge. This section is also dense with no setback laws being followed. Sankardev Campus is also located in this section.

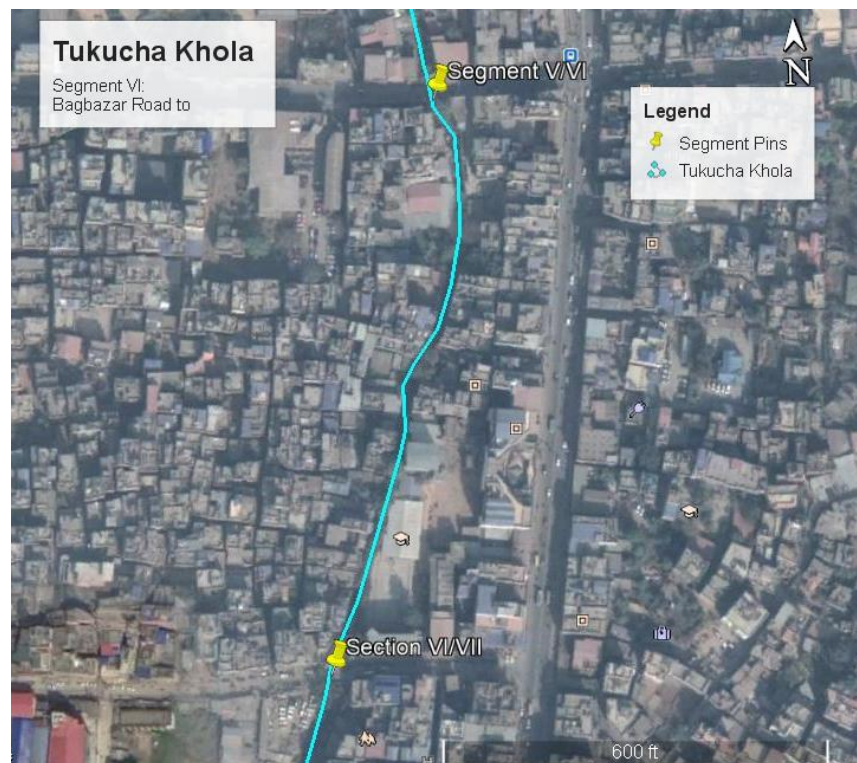


Figure 11 Segment VI - Google Maps





Figure 12 Segment VI - Photos

Segment VII

- This segment consists of existing Ichchhumati Tarkari Bazaar Area.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : $27^{\circ}42'11.36''\text{N}$, $85^{\circ}19'17.31''\text{E}$
 - End Co-ordinates: $27^{\circ}42'6.19''\text{N}$, $85^{\circ}19'15.33''\text{E}$
- Length of Segment : 160m

Observation & Findings

On the right of the river, Ichchhumati Tarkari Bazar is present while the left side of the river has been developed into a walkway. However, the vegetable market has occupied the setback space as well.



Figure 13 Segment VII - Google Maps



Figure 14 Segment VII- Photos

Segment VIII

- This segment runs through eastern side of the Bhrikutimandap Area.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : 27°42'6.19"N, 85°19'15.33"E
 - End Co-ordinates: 27°41'56.14"N, 85°19'11.76"E
- Length of Segment : 320m

Observations & Findings

On this segment of the river, right side of the river is currently occupied by the street market and the left side is occupied by buildings. A large portion of the Bhrikutimandap area can be used for design purpose.



Figure 15 Segment VIII - Google Maps



Figure 16 Segment VIII - Photos

Segment IX

- This segment runs through eastern side of the Bhadrakali Area.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : 27°42'6.19"N, 85°19'15.33"E
 - End Co-ordinates: 27°41'45.38"N, 85°19'7.69"E
- Length of Segment : 350m

Observations & Findings

The segment passes through Bhadrakali Army area which is a restricted zone. There are open spaces in this segment which can be developed as open parks with walkways and cycle lanes.



Figure 17 Segment IX- Google Maps



Figure 18 Segment IX - Photos

Segment X

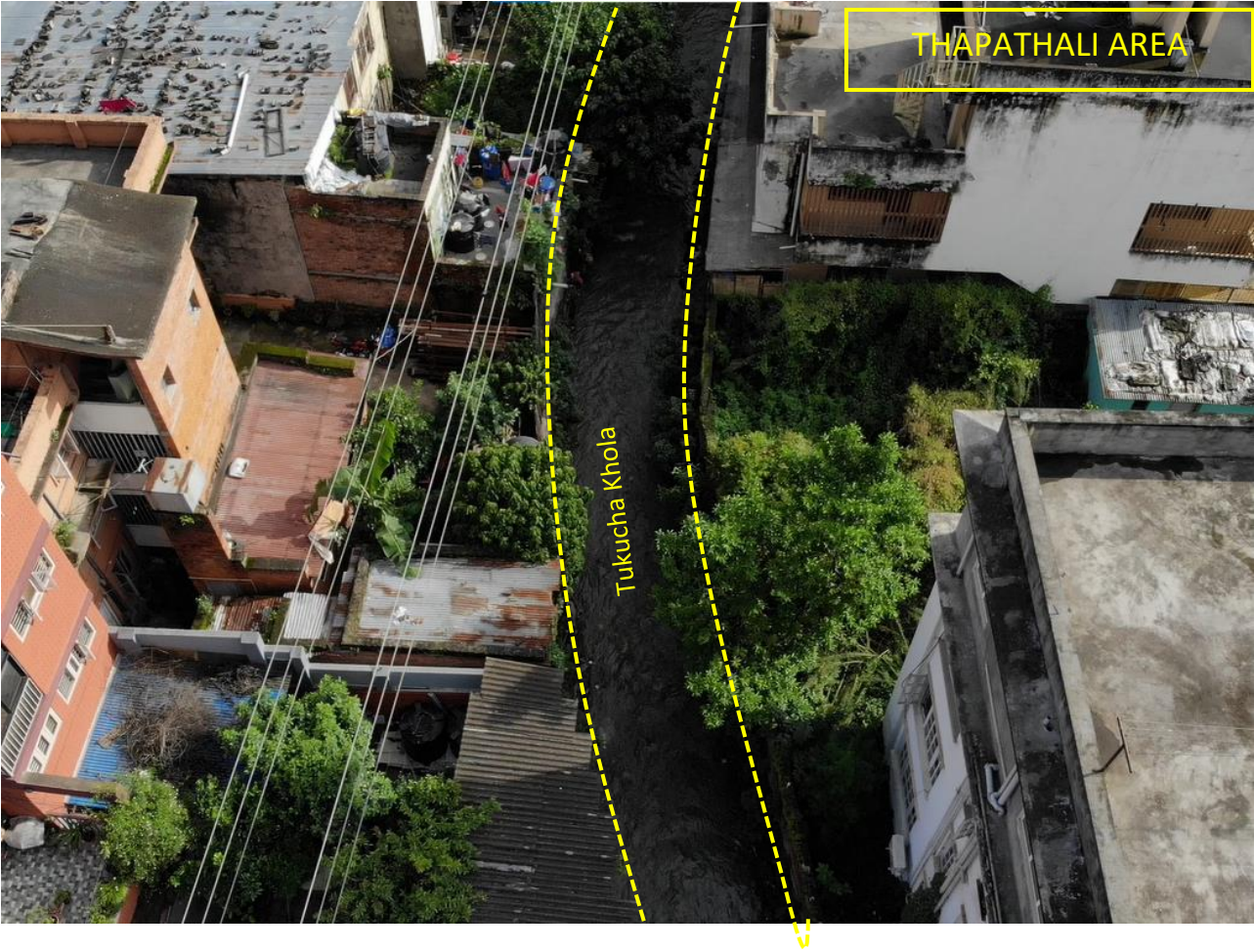
- This segment runs from Bhadrakali to Bagmati River.
- The GPS Co-ordinate of the segment is given below,
 - Starting Co-ordinates : 27°41'45.38"N, 85°19'7.69"E
 - End Co-ordinates: 27°41'27.84"N, 85°18'52.25"E
- Length of Segment : 660m

Observations & Findings

From Thapathali to Tripureshwor Road, the segment is densely occupied at some regions while areas around Thapathali Campus has some free spaces. Further ahead from the Tripureshwor road lies Kalmochan Mahadev temple area and the river meets Bagmati river. A treatment plant to treat the waste water coming from the proposed sewers shall be provided to discharge treated water to the Bagmati river.



Figure 19 Segment X - Google Maps



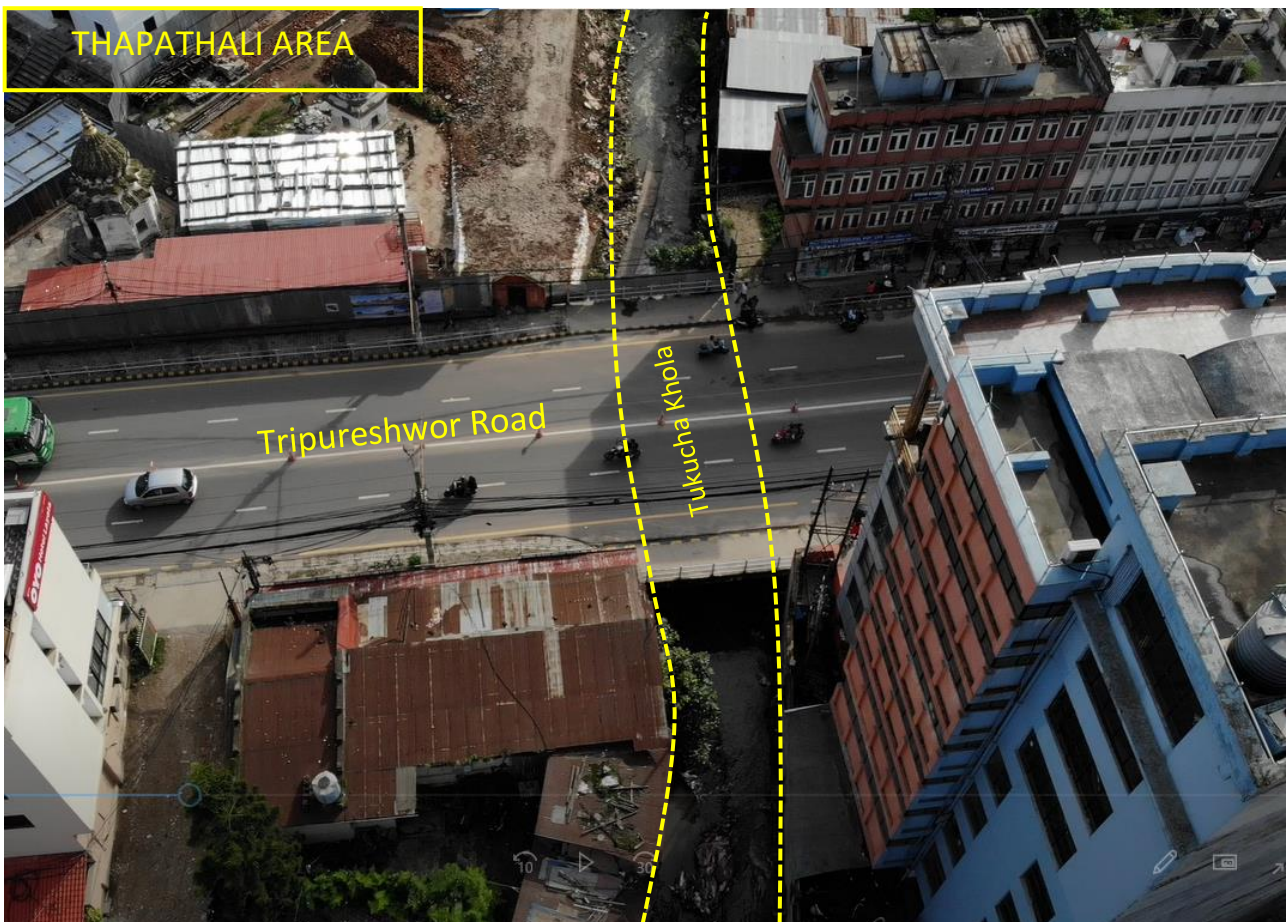




Figure 20 Segment X - Photos

3.2. Satellite Image



SATELLITE IMAGE
SOURCE: GOOGLE MAPS

GOVERNMENT OF NEPAL MINISTRY OF URBAN DEVELOPMENT HIGH POWERED COMMITTEE FOR INTEGRATED DEVELOPMENT OF THE BAGMATI CIVILIZATION GUHESHWORI, KATHMANDU	PROJECT: PRE-FEASIBILITY STUDY FOR TUKUCHA KHOLA CORRIDOR MANAGEMENT		Submitted by: BONAFIDE ENGINEERING CONSULTANCY PVT. LTD. SANEPA, KATHMANDU, NEPAL		Date: 15/05/2077
	DRAWING TITLE SATELLITE IMAGE		Design by: Ar. Shuvekshya Acharya	Checked by: Er. Anil Manandhar	Scale: 1:12500
					Sheet No: M1

3.3. Cadastral Map

[Refer to Annex I]

3.5. Hydrological study

Tukucha, also known as Ichhumati, originates at Maharajgunj inside the Valley. It is about 5.91 km long single channel without any tributary but due to city encroachment its origin is assumed to be shifted and hence length of channel has been decreased. It joins the Bagmati at Kalmochan, Thapathali. The total catchment area of Tukucha is about 8.31 sq km. It is the most polluted amongst all the tributaries. At present, Tukucha has become an open sewage drain. The river sides have been extensively encroached by squatters, residential buildings and road construction. In some stretches such as Durbar Marg and Kamaladi, the river flows underneath the buildings. The entire stretch of the river has been used for dumping solid waste and waste water into the river. Bhatbhateni temple, Nil Saraswati and Tudal Devi are important religious sites located along this river and these sites are well preserved.

The Hydrological study of Tukucha Khola has been conducted with the view to determine hydrological parameters and information to ensure that all storm water and the flood discharge can be conveyed freely by the Tukucha Khola without disturbing to planned developments in the corridor.

The following analysis were done to determine the required parameters.

Method of analysis

(DHM/WECS) method to determine discharge of Tukucha Khola

The WECS/DHM method, based on flood frequency analysis, is recommended for the context of Nepal after performing few case studies. In this method, the most significant independent variable is the area of the basin below 3000m elevation. This area represents the portion of the basin that is influenced by monsoon precipitation. The results of this method are not applicable to basins located entirely above 3000m elevation. Also, even if the proportion of a basin lying below 3000m is very small, the results of this method will not be particularly reliable.

As per the recommendation of the Water and Energy Commission Secretariat / Department of Hydrology and Meteorology (WECS/DHM) of Nepal, the flood flows of any river of catchment area A (km²) lying below 3000m elevation are given by:

Instantaneous Peak flood for a return period of 2 years, $Q_2 = 1.8767 * (A + 1)^{0.8783}$

Instantaneous Peak flood for a return period of 100 years, $Q_{100} = 14.63 * (A + 1)^{0.7342}$

The flood flow for any other return period, T years, can be found as:

$$Q_T = \exp(\ln Q_2 + s * \sigma)$$

Where,

A = area below 3000m elevation

σ = standard deviation of natural logarithms of annual floods = $\ln(Q_{100} / Q_2) / 2.326$

s = Standardized normal variate from a particular return period

= 0, 0.842, 1.282, 1.645, 2.054, 2.326, and 2.576 for T = 2, 5, 10, 20, 50, 100, and 200 years, respectively

Manning's equation to determine the maximum height from bed level (HFL)

Manning's equation is an empirical equation mainly used for open channel flow which has been used to develop depth discharge relationship and required depth is determined.

$$Q = \frac{1}{n} * A * R^{\frac{2}{3}} * S_o^{1/2}$$

Where,

Q= Discharge (m³/s)

n= Manning's coefficient

A= Cross sectional area of channel

= b*y (Rectangular channel considered) where b=width of channel and y= depth

R = Hydraulic Radius (Area/Wetted perimeter)

S_o = Channel slope (Difference in elevation/channel length)

Data obtained: For different return period

Return period (t)	s	Flood Discharge (Q m ³ /sec)	Width of channel (b in m)	Maximum height from bed level (y in m)
2	0	13.32	4	1.44
5	0.842	24.93	4	2.29
10	1.282	34.60	4	2.96
20	1.645	45.33	4	3.67
50	2.054	61.47	4	4.71
100	2.326	75.27	4	5.59

3.6. Waste Management

As seen on the site assessment, the river is being used for waster water disposal in many areas. Sewer pipes are being disposed to the river and this activity has led to the pollution in the river.



Figure 21 Sewers disposed to the river



3.7. Religious Areas

On the river alignment, Neel Saraswati Temple and Kalmochan Mahadev temple are the only religious site. So site appropriate design is to be done considering the religious values of the river in the area.



Figure 22 Neel Saraswati Temple



Figure 23 Kalmochan Mahadev Temple

3.7. Restricted Areas

The river flows through some of the restricted areas listed below:

- Embassy of People's Republic of China
- Narayanhiti Palace Museum
- Nepal Army, Bhadrakali

Due to the restrictions, it was not possible to conduct survey in these areas. However, Cadastral map and Satellite image give us the information that are required. In case of Narayanhiti Palace Museum, the large area on the left of the river has been designed for vehicle parking and parks. In other areas, corridor walkways are proposed on either side of the river.

4. Design

4.1. River Alignment

The river alignment as obtained from satellite image as well as cadastral map is provided in Annex I of this report.

4.2. Preliminary Design

This conceptual design proposes following concepts along the river corridor

- Walkway/cycle lane across the river length
- Parking space (>500 vehicles) at Narayanhiti Palace Museum
- Organized Ichchhumati Tarkari Bazar
- Public park, vehicle parking, book kiosks, street market at Bhrikutimandap
- Public Toilets at every 500m interval
- Tree plantation along the river bank
- Drainage management
- Treatment plant at Bagmati Confluence
- Provision for open parks at free spaces

The preliminary Zoning plan is illustrated in the map as provided in Annex I in this report.

Segment Data					
S.N	Segment ID	Chainage		Length	Description
		Start	End	meters	
1	Segment I	0+000	0+780	780	From Tundal Devi Temple to Embassy of People's Republic of China
2	Segment II	0+780	1+795	1015	From Embassy of People's Republic of China to Gairidhara
3	Segment III	1+795	2+270	475	Through Narayanhiti Palace Museum
4	Segment IV	2+270	2+710	440	From Narayanhiti Palace Museum to Teendhara Marg
5	Segment V	2+710	3+175	465	From Teendhara Marg to Bagbazar Road
6	Segment VI	3+175	3+470	295	From Bagbazar road to Adwait Marg
7	Segment VII	3+470	3+630	160	Through Ichchhumati Tarkari Bazaar
8	Segment VIII	3+630	3+970	340	Through Bhrikutimandap Area
9	Segment IX	3+970	4+325	355	Through Bhadrakali Area
10	Segment X	4+325	4+985	660	From Bhadrakali to Bagmati river.

1. Segment I

The first segment begins from Tundal Devi Temple to Embassy of People's Republic of China. This segment is mainly residential with 6m wide road on the right side of the river flow direction and left side is subjected to encroachment at most of the parts by people. The river itself has been covered with slab and used as a sidewalk.

It is proposed to restore and uncover the river, clear out the setback and design a proper sidewalk in this section.



Figure 24 Existing Condition- Segment I



Figure 25 Typical Design – Segment I

2. Segment II

The second segment begins from Embassy of People's Republic of China to Gairidhara (north of Narayanhiti Palace Musuem). This segment is also mainly residential with 6m wide road on the left side of the river flow direction and right side is subjected to encroachment at most of the parts by people. At some portions of the length, river is covered by slab and exposed in some parts. At some portions, the river is not accessible through either side and boundary walls have been constructed on the edge of the river and the setback space of 4m has not been followed in most parts.

It is proposed to restore and uncover the river, clear out the setback and design a proper sidewalk or cycle lane in this section. At appropriate spaces, public toilets and open parks could also be provided.



Figure 27 Existing Condition - Segment II



Figure 26 Typical Design – Segment II

3. Segment III

This section passes through eastern portion of Narayanhiti palace museum with Republic Memorial Park on the left of the river flow direction. There is approximately 25,270sqm of open space available on the left of the river flow inside the Narayanhiti Palace Museum. It is proposed here to design vehicle parking and public park in this section. For Security purposes on the other side of the river, a buffer zone with high boundary wall can be provided.

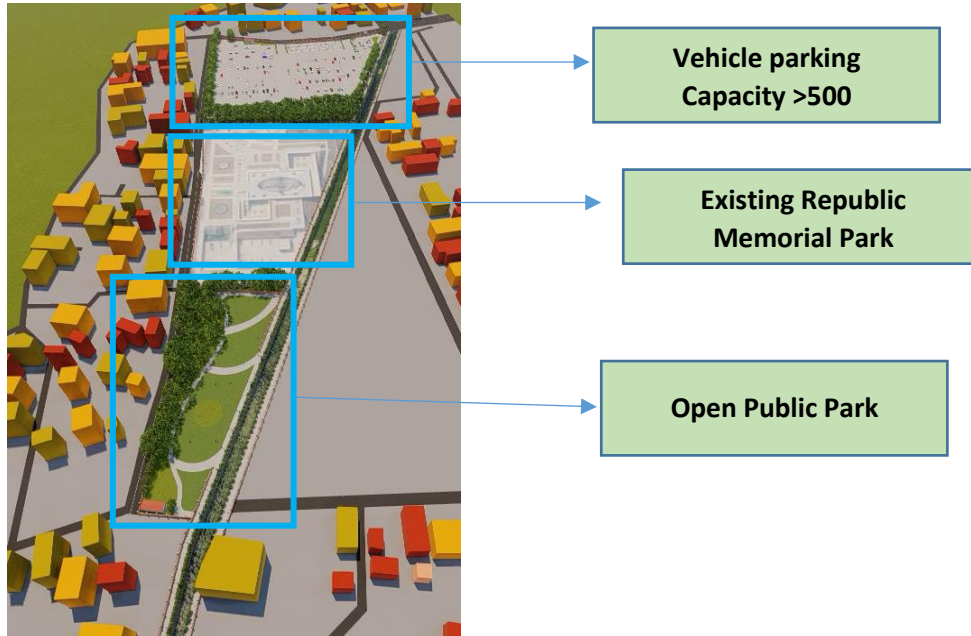


Figure 28 Segment III : Narayanhiti Palace Museum



Figure 29 Vehicle Parking

4. Segment IV

This segment begins outside Narayanhiti Palace Musuem to Teendhara Marg. Almost all the portion this section is buried underneath either road or buildings. So, It is proposed to clear out the river setbacks and design a proper walkway/cycleway corridor on both sides of the river bank.



Figure 30 Typical Design with walkways/cycle lanes on both sides

5. Segment V

This segment begins from Teendhara Marg to Bagbazar road. River is mostly visible in this section of the river. There are some open areas available in this section while some areas are densely built. The river banks are inaccessible due to buildings being built right to the edge invading the setback spaces. It is proposed to design a proper walkway or cycle lane on both sides of the river and provide open parks and public toilets at available pocket spaces.



Figure 31 Typical Design with open parks

6. Segment VI

This segment begins from Bagbazar Road to Adwait Marg. River is mostly visible in this segment of the river but mostly inaccessible due to buildings being built right to the edge. In this Segment, it is proposed to design walkway or cycle lane on both sides of the river and open parks with book stalls at open areas near to educational institutions.



Figure 33 Existing Condition - Segment VI



Figure 32 Typical Design with Book Kiosks

7. Segment VII

This segment consists of existing Ichchhumati Tarkari Bazaar Area. On the right of the river, Ichchhumati Tarkari Bazar is present while the left side of the river has been developed into a walkway. However, the vegetable market has occupied the setback space as well. So, it is proposed to organize the vegetable market area with provision for proper walkway/cycleway also providing a parking space for vehicles .

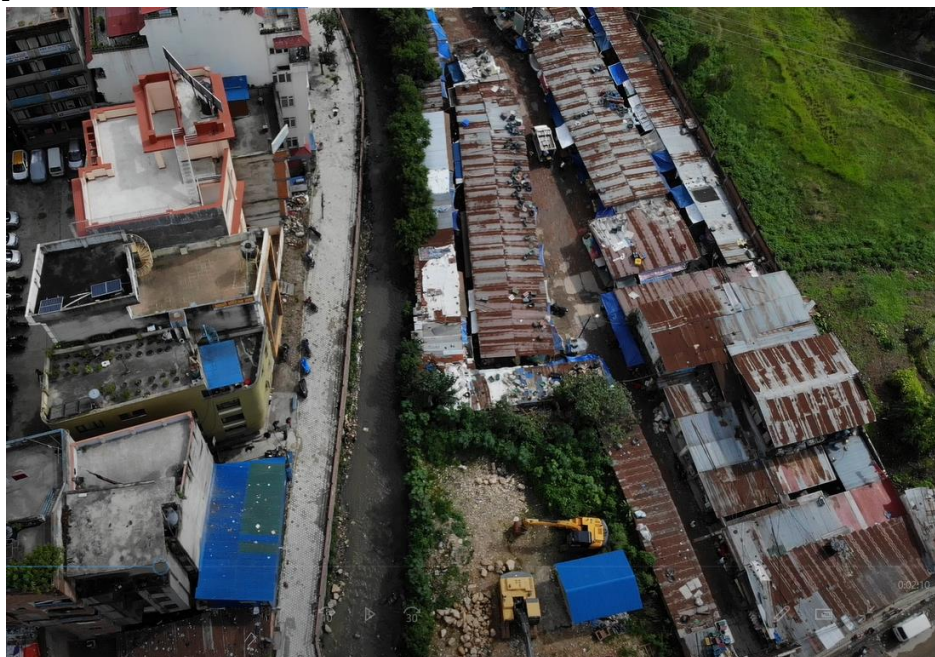


Figure 34 Existing Condition - Ichchhumati Tarkari Bazaar



Figure 36 Vehicle Parking at Ichchhumati Tarkari Bazaar



Figure 35 3D Design - Ichchhumati Tarkari Bazaar

8. Segment VIII

This segment runs through eastern side of the Bhrikutimandap Area. On this segment of the river, right side of the river is currently occupied by the street market and the left side is occupied by buildings. It is proposed to design the large portion of area along the Bhrikutimandap area for open public park and vehicle parking. Alternately, this area can be used for multistorey vehicle parking as well.



Figure 37 Existing Condition - Bhrikutimandap

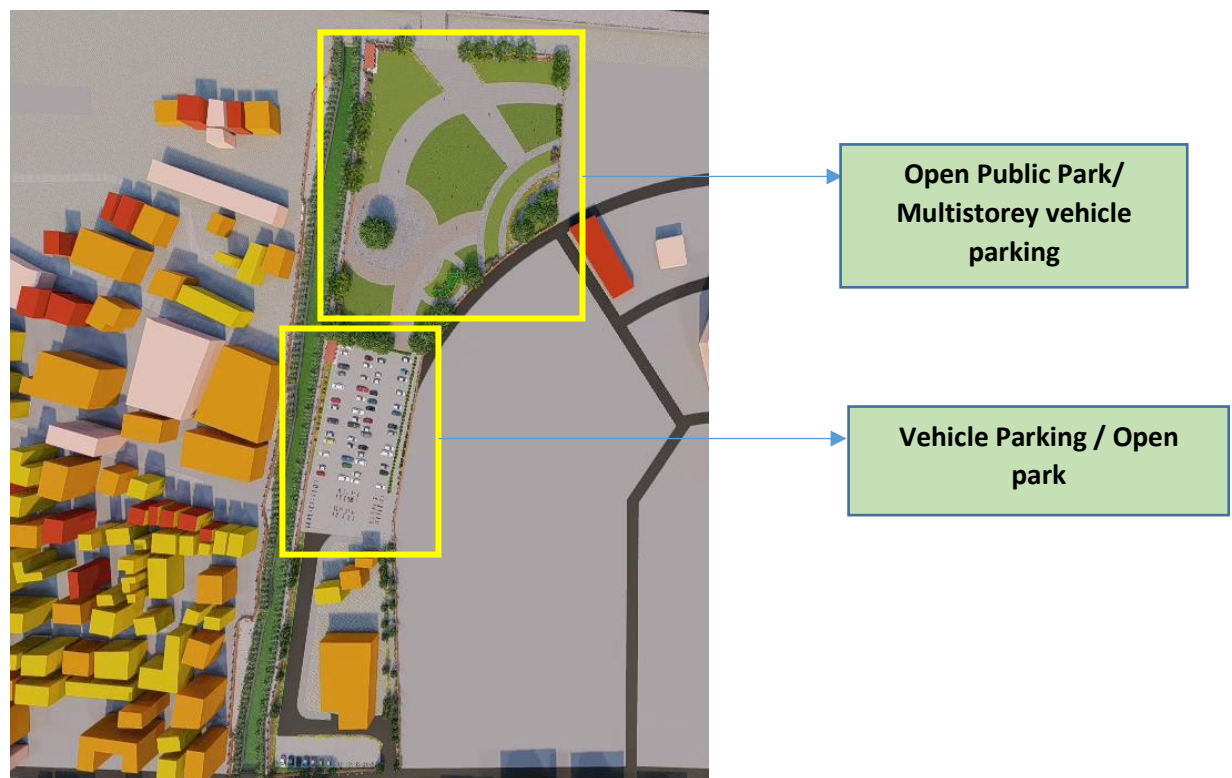


Figure 38 Proposed 3D Design - Bhrikutimandap



Figure 39 Proposed 3D Design - Bhrikutimandap

9. Segment IX

The segment passes through Bhadrakali Army area which is a restricted zone. There are open spaces in this segment which can be developed as open parks with walkways and cycle lanes.

In case of the restricted zone, only walkways and cycle lanes will be provided and the restricted areas shall be buffered with boundary walls and plantation.



Figure 40 Typical 3D with open park on one side

10. Segment X

This segment runs from Bhadrakali to Bagmati River. At the densely built areas along the river, it is proposed to design walkways or cycle lane on both sides of the river. In the open spaces around the Thapathali Campus, walkways/cycle lanes along with book kiosks are designed. Near the Bagmati river confluence, treatment plant is proposed to treat the waste water collected from the proposed sewers to safely discharge the water to the river.



Figure 41 Typical 3D with Book kiosks on one side

4.3. River Alignment with Cadastral Data

The Cadastral Data has been purchased from Department of survey at Minbhawan, Kathmandu. From the Cadastral map, setback line of 4 meters from the edge of the river has been taken and total area to be acquired including private and public land spaces has been calculated.

The Alignment drawings with all the necessary data is provided in the Annex I of this report.

4.4. Land Acquisition

As seen on the site survey, the river has been encroached at many places and the river byelaws has been violated. The illegal constructions are to be cleared and those fulfilling the byelaws could be provided with compensation in order to use the 4 meter setback as corridor space.

Some of the examples of bye laws violation can be seen on the photos below:





4.4.1. Parcel Data

From the Cadastral data obtained from Department of Survey, current owners of the plots withing 4m setback of the river edge were obtained from the Malpot Office, Dillibazaar. Plots that could not be found on the database of Malpot office were obtained from the fieldbook obtained from Naapi Karyalaya, Dillibazaar. Provided below is the list of plots within 4m setback of river and the description.

S.N	PARCEL NO	WARD NO	Grid	Area (Sq.m)	Remarks	Owner name
1	0	0	102110503	10.142	NA	
2	7	1	102106523	443.811	NA	
3	11	1	102106523	1.937		Naina Kumari Devi Rana (F)
4	17	1	102106523	147.443	Road (F)	
5	331	1	102106518	258.176		Janak Laxmi Sakhu (F)
6	406	1	102106508	1839.919	Narayanhiti Palace Musuem	
7	406	1	102106509	2098.781	Narayanhiti Palace Musuem	
8	406	1	102106513	2648.292	Narayanhiti Palace Musuem	
9	574	1	102106513	352.709	Road (F)	
10	802	1	102106509	4.545		Ashicha Suchikar (F)
11	1759	1	102106518	146.49	NA	
12	1833	1	102106523	227.341		Nirmala (F)
13	2125	1	102106523	9.327		Subarna Kumar (F)
14	2127	1	102106523	16.717		Fatey Bahadur Samet (F)
15	2128	1	102106523	4.667		Fatey Nem Kaji Samet (F)
16	2129	1	102106523	53.087		Umesh Sherpa (F)
17	2130	1	102106523	73.275		Nem Kaji (F)
18	2315	1	102106518	63.058	Baki (F)	
19	2664	1	102106518	90.479	NA	
20	2733	1	102106523	4.352	Baki (F)	
21	4158	1	102106523	24.228		Sadak Bibhag (F)
22	4159	1	102106523	67.484		Kamal Rajkarnikar (F)
23	4167	1	102106518	129.219		Nani Baba Pradhan (F)
24	4227	1	102106523	353.727		A.B.L Developers Pvt. Ltd
25	4480	1	102106523	16.216	Ja. Gha. Baki (F)	
26	4661	1	102106518	41.049		Pratima Rana (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
27	5020	1	102106518	274.673		Pratima Rana (F)
28	5022	1	102106518	73.461		Pratima Rana (F)
29	5219	1	102106518	24.862		Bima Lal Chand (F)
30	5220	1	102106518	299.272	Ja. Gha. Baki (F)	
31	1	2	102102524	76.517		Kumari Bhagwati (F)
32	1	2	102102525	747.154		Kumari Bhagwati (F)
33	1	2	102106504	128.848		Kumari Bhagwati (F)
34	2	2	102102524	431.129	Sarwajanik Bato (F)	
35	2	2	102102524	44.781		Sri Panch ko Sarkar
36	2	2	102102525	294.821		Sri Panch ko Sarkar
37	2	2	102102525	753.617		Sri Panch ko Sarkar
38	2	2	102106504	873.946	Tukucha	Sri Panch ko Sarkar
39	2	2	102106504	121.626	Road	Sri Panch ko Sarkar
40	2	2	102106504	37.794	Tukucha	Sri Panch ko Sarkar
41	3	2	102102524	14.023	Sarwajanik Bato (F)	
42	3	2	102102525	12.752	Sarwajanik Bato (F)	
43	4	2	102102524	438.923		Sri Panch ko Sarkar
44	5	2	102102524	117.647		Sri Panch ko Sarkar
45	5	2	102106504	97.338		Ramesh Chandra Hamal Thakuri
46	6	2	102102524	0.023		Sri Panch ko Sarkar
47	11	2	102102525	9.681		Kasturi Pradhan Shrestha (F)
48	22	2	102102525	77.633	NA	
49	27	2	102106504	93.611		Ajit Kumar Mishra (F)
50	28	2	102106504	45.788		Shri Mati Uma Raj Bhandari (F)
51	29	2	102106504	97.658		Santa Narayan Rajbhandari
52	30	2	102106504	88.023		Hrimadri Kumar Thapa, Nandani Laahe
53	35	2	102106504	17.111		Swosthani Devi Nakarmi
54	36	2	102106504	91.793		Menuka Joshi
55	37	2	102102525	36.44		Upendra Prasad Upadhyay Bhattarai
56	37	2	102106504	15.565		Upendra Prasad Upadhyay Bhattarai
57	38	2	102102525	107.123		Upendra Prasad Upadhyay Bhattarai
58	39	2	102102525	52.35	NA	

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
59	44	2	102102525	16.146		Sharmila Giri
60	45	2	102102525	64.819		Sumi Manandhar
61	45	2	102106504	3.893		Pashupatinathka Tikinchha Guthi
62	46	2	102102525	20.758	NA	
63	47	2	102102525	28.541		Sannani Poudel
64	47	2	102106504	38.464		Renu Joshi
65	48	2	102102525	58.126	NA	
66	48	2	102106504	50.187		Ishwor Bahadur Shrestha
67	62	2	102102525	59.739		Padam Kumari Karki
68	65	2	102102525	38.572		Rassu Karki
69	68	2	102102525	42.848		Chiltan Gurung
70	69	2	102102525	44.924		Maan Kumari shrestha
71	72	2	102102525	1.07		Yam Bahadur Basnet, Til Kumari Basnet
72	73	2	102102525	0.722		Shova Thapa Shrestha
73	79	2	102106504	57.381		Gokarneshwar Nitya Puja Guthi (Raitaney) (F)
74	80	2	102106504	22.679	NA	
75	83	2	102106504	53.269		Bishnu Mishra
76	84	2	102102525	0.682		Sri Panch ko Sarkar
77	136	2	102102525	16.549		Sabitri Rana, Madhur Rana
78	145	2	102106504	4.75		Anjana Bhandari
79	194	2	102106504	54.572		Surya Maya Shrestha
80	195	2	102106504	7.205	Road	Shiva Gopal Shrestha
81	204	2	102106504	37.898		Sri Panch ko Sarkar
82	205	2	102106504	70.131		Kalu Gurung (F)
83	206	2	102106504	24.379		Sri Panch ko Sarkar (F)
84	207	2	102106504	130.397		Tara Gurung (F)
85	208	2	102106504	57.463		Kalu Gurung (F)
86	209	2	102106504	11.173	Baki (F)	
87	214	2	102106504	68.253		Suresh Nakarmi (F)
88	215	2	102106504	32.157		Prem Krishna Maharjan
89	223	2	102106504	6.674		Shri Panch ko Sarkar (F)
90	224	2	102106504	48.151		Sarita Devi Yadav Siwaliya (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
91	225	2	102106504	4.516		Sri Panch ko Sarkar (F)
92	226	2	102106504	62.274		Triratna Tuladhar, Ramita Tuladhar Sthapit, Sushil Bir Singha Kansakar, Guhodhar Tuladhar
93	237	2	102106504	29.781		Swosthani Devi Nakarmi (F)
94	238	2	102106504	31.18		Nepal Government
95	241	2	102102524	38.791		Kesab Raj Bista (F)
96	242	2	102102524	10.699		Nani Maiya Bista and Kesab Raj Bista (F)
97	249	2	102106504	3.425		Continental Trading Enterprises Pvt. Ltd. (F)
98	251	2	102102524	126.585		Geeta Shrestha
99	251	2	102106504	1.571		Continental Trading Enterprises Pvt. Ltd. (F)
100	251	2	102106504	53.99		Continental Trading Enterprises Pvt. Ltd. (F)
101	253	2	102106504	18.602		Continental Trading Enterprises Pvt. Ltd. (F)
102	254	2	102106504	9.614		Nepal Government Road (F)
103	255	2	102106504	160.011		Continental Trading Enterprises Pvt. Ltd. (F)
104	255	2	102106509	15.943		Continental Trading Enterprises Pvt. Ltd. (F)
105	256	2	102106504	48.384		Nepal Government Road (F)
106	260	2	102102524	7.518		Prakash Kumar Karki
107	260	2	102106504	42.331		Ratna Devi K. C. (F)
108	261	2	102102524	11.422		Bikash Khadka
109	262	2	102102524	42.526		Bikash Khadka
110	262	2	102106504	45.179		Baba Maiya Bajracharya
111	263	2	102106504	14.623	Padma Kanya Campus	Nepal Government Road
112	269	2	102102524	74.897		Belu Rai
113	281	2	102102525	20.888		Uttam Narayan Manandhar
114	282	2	102102525	20.297		Dhanamaya Maharjan
115	291	2	102106504	27.151		Ganesh Maharjan
116	292	2	102106504	21.077		Gyanuraj Maharjan
117	294	2	102106504	78.553		Prameswori Acharya Dhital
118	301	2	102102525	4.808		Santoshi Adhikari Dahal, Bijaya Bhandari Dahal
119	302	2	102102525	8.457		Santoshi Adhikari Dahal, Bijaya Bhandari Dahal

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
120	303	2	102102525	45.095		Manilal Shrestha
121	309	2	102102524	25.349		Ambi Ratna Shakya
122	310	2	102102524	68.975		Nirmala Shakya
123	311	2	102102524	16.656		Ambi Ratna Shakya
124	311	2	102106504	14.736		Jagatmaya Maharjan
125	312	2	102106504	8.472		Prem Krishna Maharjan
126	343	2	102102524	34.461		Rajan Prasad Dahal
127	349	2	102102524	39.908		Bir Dangol
128	365	2	102102524	25.972		Thakur Prasad Poudel
129	395	2	102102524	13.897		Nepal Government
130	664	2	102102524	24.986		Prachandra Manandhar
131	669	2	102102524	40.794		Prabha Chitrakar (Manandhar)
132	749	2	102102524	33.752		Shyam Krishna Manandhar
133	759	2	102102524	30.263		Timila Manandhar
134	50000	2	102106509	125.532	NA	
135	2	4	102102621	48.217		Sri Panch ko Sarkar
136	3	4	102102525	121.05		Barnabas Museum Hotel Pvt. Ltd
137	3	4	102102621	82.552		Anish Kumar Sharma
138	9	4	102102525	475.073		Nepal Government
139	12	4	102102525	27.938		Mithu Upadhyay
140	13	4	102102613	48.207		Suntali Lama (F)
141	14	4	102102525	41.414		Mithu Upadhyay
142	14	4	102102621	75.21		Sri Panch ko Sarkar
143	14	4	102102621	124.626	Khola (F)	
144	15	4	102102613	40.066		Bina Thapa (F)
145	15	4	102102621	71.984		Sri Panch ko Sarkar
146	16	4	102102621	37.08	Patti (F)	Sri Panch ko Sarkar
147	16	4	102102621	22.458		Sri Panch ko Sarkar
148	16	4	102102621	9.028		Sri Panch ko Sarkar
149	17	4	102102621	39.178		Govinda Thapa Magar (F)
150	18	4	102102621	19.03		Shakti Bahadur Magar (F)
151	19	4	102102621	15.403		Dil Bahadur Thapa (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
152	20	4	102102621	43.599		Buhad Narayan Maharjan (F)
153	21	4	102102621	13.893		Khadka Kumari Dahal (F)
154	22	4	102102621	13.495		Krishna Bahadur Adhikari (F)
155	23	4	102102621	16.591		Krishna Prasad Poudel (F)
156	24	4	102102621	33.876		Sabitri Ghimire (F)
157	25	4	102102617	19.285		Sabitri Bhattarai (F)
158	25	4	102102617	4.402		Sabitri Bhattarai (F)
159	29	4	102102525	57.877		RamesH
160	32	4	102102525	2.428		Mithu Upadhyay
161	33	4	102102525	6.924		Ramesh Prasad Bhattarai
162	33	4	102102621	174.707		Santi Maya Lama
163	35	4	102102621	7.939		Sri Panch ko Sarkar
164	36	4	102102525	65.164		Ramekin Shah (F)
165	37	4	102102525	37.843		Mahadi Rana (F)
166	37	4	102102621	9.993		Mahadi Rana (F)
167	38	4	102102621	38.421	Road (F)	Nepal Government (F)
168	39	4	102102525	11.224	Kulo (F)	
169	40	4	102102621	49.813		Sanjita Bhattarai (F)
170	47	4	102102613	1089.303	Road (F)	
171	48	4	102102613	1012.795		Sri Panch ko Sarkar
172	49	4	102102613	30.08		Mahima Kumari Rana
173	49	4	102102621	40.695		Rosha Lohani
174	50	4	102102618	2.225		Rajeswory Thapa
175	50	4	102102621	39.182		Ramita Pradhan
176	52	4	102102613	33.426		Menuka Devi Shah (F)
177	53	4	102102608	138.733		Pashupatinath Bhandar Tahabil Guthi
178	53	4	102102617	17.77		Manju Gurung
179	54	4	102102613	55.604		Yadav Bahadur Rayamajhi (F)
180	55	4	102102617	384.627		Birgunj Chini Karkhana Limited(F)
181	58	4	102102617	2.849		Sri Panch ko Sarkar
182	60	4	102102617	8.161		Sri Panch ko Sarkar
183	61	4	102102617	157.213		Narayan Raj Timalisina

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
184	62	4	102102617	47.818		Kabita Parajuli
185	63	4	102102617	16.722		Dilesh Rayamabhapi
186	64	4	102102608	34.544		Babulal Prajapati
187	64	4	102102617	76.551		Babulal Prajapati
188	65	4	102102608	161.597		Sri Panch ko Sarkar
189	66	4	102102617	52.182		Chandra Lal Maharjan
190	68	4	102102617	484.793	Baki (F)	
191	70	4	102102621	29.829	NA	
192	71	4	102102621	48.512		Kishor (F)
193	72	4	102102621	571.842		Sangita (F)
194	74	4	102102613	27.799	NA	
195	76	4	102102621	106.422		Tribedi Rana (F)
196	78	4	102102613	32.518		Sahid Sharma (F)
197	78	4	102102621	79.853		Nepal Government
198	78	4	102102621	50.063		Nepal Government
199	79	4	102102613	29.158	Road (F)	
200	80	4	102102621	27.655	Baki Ja. Gha. (F)	
201	83	4	102102616	222.878		Saroj Kanta Babi Silwal
202	83	4	102102621	8.109		Shyam Marwadi
203	85	4	102102621	31.781		Krishna Bahadur Adhikari (F)
204	86	4	102102621	68.212	Baki Ja. Gha. (F)	
205	88	4	102102616	126.157	Road (F)	
206	95	4	102102613	53.545	NA	
207	96	4	102102613	100.531		Indhira Shrestha (F)
208	97	4	102102613	19.413		Kesh Kumari Jaimini (F)
209	99	4	102102613	163.466		Sri Panch ko Sarkar
210	107	4	102102617	20.274		Sri Panch Aadmi Raj Kumari Shanu Rajya Laxmi Devi (F)
211	108	4	102102617	54.842		Shivaram Pradhan (F)
212	109	4	102102617	299.185		Sri Panch ko Sarkar
213	110	4	102102613	17.139		Sri Panch ko Sarkar
214	112	4	102102617	41.795		Sabitri Devi Rayamabhapi

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
215	147	4	102102621	134.027	NA	
216	148	4	102102608	0.244	NA	
217	151	4	102102608	99.698		Sri Panch ko Sarkar
218	152	4	102102608	8.402		Sri Panch ko Sarkar
219	154	4	102102608	273.517		Sri Panch ko Sarkar
220	155	4	102102608	3.867		Sri Pach ko Sarkar
221	167	4	102102617	49.257		Krishna Bahadur Rayamabhapi
222	168	4	102102617	8.903		Prem Kumari Rana, Sanat Rayamabhapi
223	173	4	102102618	14.371		Mahima Kumari Rana
224	174	4	102102617	94.634		Shova Bhattarai Lamichhane
225	180	4	102102613	7.768	Patti (F)	
226	182	4	102102613	29.367		Laxmi Kumari Subedi Bhattarai (F)
227	184	4	102102617	1581.176	Baki (F)	
228	194	4	102102617	28.912		Laxman Budhathoki
229	195	4	102102617	40.16		Tanka Bahadur Shrestha
230	196	4	102102617	5.799		Kamala Karki
231	199	4	102102621	9.706	NA	
232	200	4	102102621	41.938	NA	
233	201	4	102102621	110.737	NA	
234	205	4	102102612	41.292		Sri Panch ko Sarkar
235	206	4	102102612	7.001	Khola (F)	
236	206	4	102102617	70.505	Khola (F)	
237	207	4	102102617	89.219		Rakesh Shakya, Manish Shakya
238	208	4	102102617	44.95		Sri Panch ko Sarkar
239	209	4	102102617	40.373		Hari Priya Chanda Thakuri
240	218	4	102102617	30.124		Sri Panch ko Sarkar
241	219	4	102102617	5.992		Himmat Bahadur Chand
242	233	4	102102613	44.168		Juna Rana
243	234	4	102102613	3.544		Nepal Government
244	237	4	102102621	21.022	NA	
245	238	4	102102621	20.843		Maili Lama
246	239	4	102102613	33.984		Kapilmani Prasai

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
247	240	4	102102613	44.865		Kapilmani Prasai
248	246	4	102102613	39.188		Sushil Kumar Aryal (F)
249	264	4	102102621	65.96	NA	
250	266	4	102102617	74.11		Laxmi Kumari Subedi
251	267	4	102102617	38.572		Nepal Government
252	283	4	102102613	11.223		Shri Panch ko Sarkar (F)
253	284	4	102102613	17.312		Ganga Kumari Khadgi (F)
254	294	4	102102613	7.936	Kholi (F)	
255	295	4	102102613	39.306		Agur Devi Panta Mishra (F)
256	319	4	102102613	38.348		Shri Panch ko Sarkar (F)
257	320	4	102102613	3.441		Jyoti Singha (F)
258	332	4	102102621	9.655	NA	
259	333	4	102102621	98.675	Nepal Stock Exchange	
260	337	4	102102613	19.15		Shri Panch ko Sarkar (F)
261	339	4	102102608	58.331	Road (F)	
262	365	4	102102613	23.242		Laxmi Malakar
263	366	4	102102613	15.73		Nepal Government
264	408	4	102102613	27.095		Saroj Kumar Shrestha
265	409	4	102102613	29.399		Suman Shrestha
266	418	4	102102613	12.085		Akendra Bahadur Karki (F)
267	419	4	102102613	40.745		Nepal Sarkar Aayog (F)
268	422	4	102102608	8.717		Sri Panch ko Sarkar Haadigaun Tudal Devi Guthi
269	431	4	102102613	3.099		Nepal Government
270	432	4	102102613	127.021		Sushila Agrawal (Sanghai), Anup Kumar Sanghai
271	437	4	102102613	5.818		Deepak Gautam (F)
272	438	4	102102613	48.433		Nepal Government
273	463	4	102102613	2.894		Sushila Agrawal (Sanghai), Anup Kumar Sanghai
274	464	4	102102613	84.122		Balbahadur KC
275	921	4	102102608	38.788	NA	
276	4	11	102114502	393.481		Military Barrack (F)
277	5	11	102114502	891.735	Tukucha (F)	

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
278	188	11	102114415	305.538	Kalmochan Area (F)	
279	188	11	102114511	82.45	Kalmochan Area (F)	
280	283	11	102110522	432.948	Road (F)	
281	284	11	102110522	14.847	Road (F)	
282	285	11	102110522	160.446	Road (F)	
283	287	11	102110522	1165.093	Tukucha (F)	
284	333	11	102114502	379.127		Asta Man Maharjan (F)
285	367	11	102114415	132.783	Bagar (F)	
286	384	11	102114506	11.901		Mohan Sharan Shrestha (F)
287	389	11	102114511	93.294	Tukucha (F)	
288	390	11	102114415	440.554	Tukucha (F)	
289	604	11	102114511	20.015		Krishna Gopal Baidya and Govinda Das Baidya (F)
290	605	11	102114511	22.621		Govinda Das Baidya (F)
291	606	11	102114511	797.77	Tukucha (F)	
292	607	11	102114511	8.793		Chinimaya Suwal (F)
293	611	11	102114506	216.421		Rotary Club (F)
294	614	11	102114511	257.475	Road (F)	
295	615	11	102114511	7.055		Krishna Kumar Rajbhandari (F)
296	616	11	102114511	43.976		Puja Guthi (F)
297	620	11	102114511	21.859		Puja Guthi (F)
298	621	11	102114511	40.158		Puja Guthi (F)
299	636	11	102114511	115.634		Mriga Nanda Bahadur Rajbhandari (F)
300	655	11	102114511	3.543	Road (F)	
301	663	11	102114415	42.598		Badan Mukteshwar Guthi (F)
302	664	11	102114415	19.867	Road (F)	
303	709	11	102114506	86.665	Open (F)	
304	724	11	102114506	60.745	NA	
305	728	11	102114506	44.321		Aakash Bhairab Guthi (F)
306	729	11	102114506	24.164		Janaki Lal Pradhan (F)
307	734	11	102114506	63.474		Manta (F)
308	735	11	102114506	20.944		Aananda Prasad Shrestha (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
309	736	11	102114506	20.499		Shyam Prasad Shrestha (F)
310	744	11	102114506	20.648		Gyan Man Kanksar (F)
311	746	11	102114506	40.363		Babu Kaji Pudasaini (F)
312	747	11	102114506	36.18		Kalmochan Guthi (F)
313	749	11	102114501	0.119		Kalmochan Guthi (F)
314	749	11	102114506	55.772		Kalmochan Guthi (F)
315	749	11	102114507	1.061		Kalmochan Guthi (F)
316	750	11	102114501	15.181		Kesav Kumar Shakya (F)
317	750	11	102114502	43.169	Thapathali Campus	
318	750	11	102114506	1.708	Thapathali Campus	
319	750	11	102114507	111.136	Thapathali Campus	
320	750	11	102114507	2.058	Thapathali Campus	
321	751	11	102114506	1407.407	Tukucha (F)	
322	752	11	102114502	137.416	Bhadrakali Army Area	
323	752	11	102114506	263.258	Thapathali Campus (F)	Technical Training Institute Thapathali Campus (F)
324	754	11	102114506	280.481		Kendriya Tathyanka Kendra (F)
325	758	11	102114502	76.857		Bekha Mani Shakya (F)
326	759	11	102114502	42.643		Shri Man Jyapu (F)
327	762	11	102114502	75.133		Lila Raj Upadhyaya (F)
328	763	11	102114502	154.668		Lila Raj Upadhyaya (F)
329	764	11	102114502	30.31		Lila Raj Upadhyaya (F)
330	765	11	102114502	82.418		Lila Raj Upadhyaya (F)
331	766	11	102114502	918.542	Tukucha (F)	
332	767	11	102114502	202.524	Road (F)	
333	768	11	102114507	72.129	Tukucha (F)	
334	810	11	102114506	35.161		Amal Devi Shrestha (F)
335	811	11	102114506	12.466		Hajuri Maiya Shrestha (F)
336	853	11	102114506	58.383		Shiva Ratna Bajracharya (F)
337	854	11	102114506	1.674		Tirtha Shova Bajracharya (F)
338	904	11	102114506	46.268		Madhusudan Man Singh Amatya (F)
339	905	11	102114506	42.384		Jit Narayan (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
340	933	11	102114506	5.983		Krishna Lal Pradhan (F)
341	933	11	102114511	43.265		Krishna Lal Pradhan (F)
342	935	11	102114506	50.373		Ghana Shyam (F)
343	961	11	102114511	69.08		Rita Rajbhandari (F)
344	962	11	102114511	48.534		Prambika Rajbhandari (F)
345	963	11	102114506	39.695		Mohan Raj Panta (F)
346	965	11	102114506	25.997		Laxmi Shakya (F)
347	978	11	102114506	45.539		Kamaleshwari Shrestha (F)
348	993	11	102114506	50.405		Kabita Parajuli (F)
349	1012	11	102114502	206.931	Baki (F)	
350	1032	11	102114511	49.069		Baba Baidya (F)
351	1033	11	102114506	30.567		Urmila Rajkarnikar (F)
352	1210	11	102114506	12.258	Baki (F)	
353	1213	11	102114511	5.282		Nepal Up Balmiki Society
354	1215	11	102114511	38.238		Nepal Up Balmiki Society
355	1236	11	102114511	14.648		Kampojo Wadal
356	1237	11	102114511	7.883		Kampojo Wadal
357	1239	11	102114511	0.015		Kampojo Wadal
358	1258	11	102114511	22.443		Gita Shova Manandhar (F)
359	1259	11	102114511	21.377	Tukucha (F)	
360	1276	11	102114506	78.918		Tribhuvan University Institute of Engineering
361	1302	11	102114511	11.118		Tina (F)
362	1308	11	102114511	44.497		Gyanmanpari Raghubedi (F)
363	1309	11	102114511	35.259		Laxmi Rajbhandari (F)
364	1310	11	102114506	2.144		Rena Karmacharya (F)
365	1310	11	102114511	77.395		Rena Karmacharya (F)
366	1363	11	102114511	2.697		Mani K.C. (F)
367	1394	11	102114511	75.089		Mani K.C. (F)
368	1411	11	102114506	39.467		Amrit Kumar Shrestha (F)
369	1412	11	102114506	15.996	Baki (F)	
370	1430	11	102114511	8.353		Bina Shrestha (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WARD NO	Grid	Area (Sq.m)	Remarks	Owner name
371	1431	11	102114511	9.392		Jaleshwari Shrestha (F)
372	1556	11	102114506	58.708		Basanta Shrestha (F)
373	1610	11	102114511	60.052		Pramod Kumar Agrawal (F)
374	1682	11	102114506	18.181		Shanti Shrestha (F)
375	1686	11	102114506	99.191		Sthaniya Bikash Mantralaya Adarsha Chapakhana (F)
376	1687	11	102114506	28.734		Chandra Kumar Pannachan (F)
377	1688	11	102114506	43.885	Baki (F)	
378	2001	11	102114415	38.363		Sudarshan Prasad Pradhan (F)
379	2061	11	102114511	169.71		Ram Badan Shrestha Baniya
380	2079	11	102114506	23.372		Durga Devi Giri
381	2082	11	102114506	24.697		Bidhya Gar Shakya (F)
382	2083	11	102114506	25.523		Machama Maharjan (F)
383	2166	11	102114415	83.752		Nima Shrestha (F)
384	2166	11	102114511	33.219		Nima Shrestha (F)
385	2392	11	102114506	20.946		Nanda Lal Maharjan (F)
386	2393	11	102114506	2.301		Nanda Kumar Maharjan
387	2395	11	102110522	613.36	Nepal Stock Exchange (F)	
388	2395	11	102114502	161.12	Nepal Stock Exchange (F)	
389	2396	11	102110522	14.439	NARC (F)	
390	2397	11	102110522	587.172	Agriculture Development Bank (F)	
391	2397	11	102114502	216.684	Agriculture Development Bank (F)	
392	2473	11	102114511	2.449		Adham Ratna Tuladhar (F)
393	2474	11	102114511	126.764		Binam Ratna Tuladhar (F)
394	0	31	102110508	17.537	NA	
395	1	31	102110517	172.686	Kathmandu Nagar Panchayat (F)	
396	4	31	102110517	121.087	National Trading Limited (F)	
397	4	31	102110522	382.725	National Trading Limited (F)	
398	8	31	102110508	71.062		Shanker Dev Campus (F)
399	91	31	102110518	0.021	Road (F)	
400	162	31	102110512	0	Bhrikutimandap (Pradarshani Sthal (F))	
401	162	31	102110517	1047.55	Bhrikutimandap (Pradarshani Sthal (F))	

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
402	162	31	102110522	189.706	Bhrikutimandap (Pradarshani Sthal (F))	
403	163	31	102110517	24.264	Road (F)	
404	164	31	102110517	2295.702	Tukucha (F)	
405	171	31	102110517	41.562		Dil Maya (F)
406	172	31	102110517	33.876	Open (F)	
407	178	31	102110522	618.915	Tukucha (F)	
408	190	31	102110512	200.287	Road (F)	
409	242	31	102110508	29.914		Nepali Jake Masulibad Nepali Jame Masjid (F)
410	247	31	102110517	17.311	NA	
411	263	31	102110503	298.383		Punu Devi Aadi (F)
412	268	31	102110508	72.389		Sajjan Ram Bhandari (F)
413	271	31	102110508	132.484	NA	
414	272	31	102110508	24.161	NA	
415	274	31	102110508	5.599		Purshottam (F)
416	298	31	102110508	56.73	Public land (F)	
417	299	31	102110508	17.57	Nagarpalika Wada Samiti (Wada No:27) (F)	
418	300	31	102110508	34.795		Ram Krishna Shrestha (F)
419	301	31	102110508	25.237		Ram Krishna Shrestha (F)
420	315	31	102110508	27.003		Sal Maya Khadgi (F)
421	319	31	102110508	99.994		Shiwa Dhunagana (F)
422	324	31	102110508	87.564		Krishna Devi Shakya (F)
423	335	31	102110508	23.404		Bagh Guthi (F)
424	339	31	102110508	15.44		Bagh Guthi (F)
425	346	31	102110508	79.701	Road (F)	
426	350	31	102110508	19.013		Bagh Guthi (F)
427	351	31	102110508	63.962		Bagh Guthi (F)
428	356	31	102110508	3.475	NA	
429	357	31	102110508	458.92	Tukucha	
430	358	31	102110508	1125.184	Tukucha	
431	363	31	102106523	75.129		Dhan devi seth (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
432	366	31	102106523	736.613	Tukucha (F)	
433	442	31	102106523	113.298	Road (F)	
434	444	31	102110503	255.804	Tukucha (F)	
435	445	31	102110503	168.689	Road (F)	
436	493	31	102110503	339.596		Kamal Kunj American Embassy (F)
437	494	31	102110503	60.674		Krishna Bahadur Tandukar (F)
438	495	31	102110503	52.617		Ratna Bahadur Tandukar (F)
439	509	31	102110503	91.99		Sharada Devi Tandukar (F)
440	510	31	102110503	67.472		Singha Ratna and Rani Ratna (F)
441	525	31	102110503	28.643		Shanta Bahadur Dongol (F)
442	528	31	102110503	26.424		Dil Bahadur Shrestha (F)
443	529	31	102110503	22.986		Purna Man Shilpakar (F)
444	530	31	102110503	20.503		Chandra Maya (F)
445	531	31	102110503	1171.331	Tukucha (F)	
446	532	31	102110503	27.64		Gorey Postha (F)
447	896	31	102110512	211.751		Samajik Sewa Sammanwaya Samiti (F)
448	1013	31	102110517	49.035		Sharhera Sthapit (F)
449	1033	31	102110508	43.634		Nani Maiya Shrestha (F)
450	1115	31	102110508	22.166		Dan Maya Maharjan (F)
451	1125	31	102110508	37.839		Jagat Nanda Prakash Swar Guthi (F)
452	1141	31	102110513	40.474		Meera Devi Silwal (F)
453	1402	31	102110508	207.317	Road	
454	1473	31	102110517	42.12		Dan Maya Maharjan (F)
455	1477	31	102110517	28.771		Pashupati Pancha Dan Guthi (F)
456	1478	31	102110517	30.478		Pashupati Pancha Dan Guthi (F)
457	1516	31	102110503	36.301		Sabitri Devi Manandhar (F)
458	1517	31	102110503	22.882		Rajesh Kumar Shrestha (F)
459	1518	31	102110503	5.293		Hari Prasad Shrestha (F)
460	1705	31	102110508	42.317		Jagananada Prakashchar Guthi (F)
461	1768	31	102110503	35.782		Ram Prasad (F)
462	1836	31	102110503	47.947		Bhuwaneshwar (F)
463	1837	31	102110503	47.558		Ratneshwar (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
464	1838	31	102110503	55.008		Jagdishwar (F)
465	1887	31	102110503	25.05		Mohan Man (F)
466	1898	31	102110503	25.513		Manoj Ratna (F)
467	1900	31	102110503	18.606		Manoj Ratna (F)
468	1902	31	102110503	94.375		Kuti Dharma Ratna (F)
469	1922	31	102110508	30.967		Ramali Devi (F)
470	1931	31	102110503	24.655	Baki (F)	
471	1931	31	102110508	8.715	NA	
472	2000	31	102110508	21.406		Hira Devi (F)
473	2232	31	102110503	47.864		Sark Sadak (F)
474	2233	31	102106523	80.49		Baki
475	2233	31	102110503	156.422		Sark Sadak (F)
476	2234	31	102106523	14.537		Baki
477	2235	31	102106523	470.6	Kathmandu Plaza	Office of Nepal Trust
478	2250	31	102110508	20.519		Ramesh Shrestha (F)
479	2251	31	102110508	15.67	NA	
480	2308	31	102110508	20.791	NA	
481	2345	31	102110508	32.613	Baki (F)	Harka Kumari, Dambar Kumari, Durga, Krishna Kumari (F)
482	2368	31	102110503	3.365		Sark Sadak (F)
483	2369	31	102110503	131.974	Baki (F)	
484	2403	31	102110508	11.57		Nanda Lal (F)
485	2460	31	102110508	37.486	NA	
486	2490	31	102110508	130.209	NA	
487	2647	31	102110513	5.654		Prakash Man Gubaju (F)
488	2735	31	102110513	3.149		Prakash Man (F)
489	2815	31	102110503	69.088		Prajanaya Raj bhandar (F)
490	2816	31	102106523	95.269		Madhusudan Raj Bhandari (F)
491	2816	31	102110503	9.543	NA	
492	2828	31	102110508	4.432		Ganga Lal Khadgi (F)
493	2845	31	102110517	18.904		Sanu Kaji Tandukar (F)
494	2846	31	102110517	16.564		Asha Kaji Tandukar (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
495	2848	31	102110517	16.638		Setey Kaji Tandukar (F)
496	2860	31	102110508	32.5		Chandra Bahadur (F)
497	2910	31	102110508	11.298	NA	
498	2953	31	102110508	35.203		Laxmi Lal Tanduakr (F)
499	2987	31	102110517	48.663	NA	
500	2988	31	102110517	69.868	NA	
501	2995	31	102110508	13.214	NA	
502	2995	31	102110508	5.207	NA	
503	2995	31	102110508	6.162	NA	
504	2995	31	102110508	2.392	NA	
505	2996	31	102110503	51.831	NA	
506	3001	31	102110508	92.51	NA	
507	3002	31	102110508	119.664	NA	
508	3010	31	102110508	48.052	NA	
509	3076	31	102110508	20.918		Uttar Ram Lal Khadgi (F)
510	3094	31	102110517	24.83		Chanmaya Tandukar (F)
511	3133	31	102110508	29.395		Suryamaya Tanduakr (F)
512	3151	31	102110508	10.781	NA	
513	3152	31	102110508	10.225	NA	
514	3153	31	102110508	10.94		Dahaya Muslim (F)
515	3192	31	102110517	84.507		Kalyan Muni Sthapit (F)
516	3198	31	102110508	32.276		Sete Kapi (F)
517	3202	31	102110513	3.28		Lila Ram Tiwari (F)
518	3204	31	102110513	7.003		Lila Ram Tiwari (F)
519	3228	31	102110508	48.147		Ram Lal Khadgi (F)
520	3260	31	102110508	87.213		Ganga Bhandari (F)
521	3280	31	102106523	83.826		Sharada Prasad Pradhan (F)
522	3281	31	102106523	83.876		Raj Durbar Kharcha Bibhag (F)
523	3282	31	102106523	172.024		Raj Durbar Kharcha Bibhag (F)
524	3345	31	102106523	14.741		Shri Panchko Sarkar Sadak Bibhag (F)
525	3346	31	102106523	1.583		Baki Ja. Gha. (F)
526	3542	31	102110508	38.605		Baki Ja. Gha. (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WARD NO	Grid	Area (Sq.m)	Remarks	Owner name
527	3543	31	102110508	20.058		Sunil Maharjan (F)
528	3544	31	102110508	16.965		Baki Ja. Gha. (F)
529	3782	31	102110517	61.044		Dhirendra Kumar Hojani & Kiran Hojani (F)
530	3797	31	102110517	86.454		Dhirendra Kumar Hojani & Kiran Hojani (F)
531	3798	31	102110517	82.857		Kiran Hojani (F)
532	50000	31	102110518	0.222	NA	
533	0	32	102110513	10.331	NA	
534	8	32	102110513	215.483	Sankardev Campus	
535	21	32	102110513	5.591		Society Guthi (F)
536	38	32	102110513	5.85	NA	
537	39	32	102110513	14.444	NA	
538	43	32	102110513	17.895		Bhari Pandey (F)
539	71	32	102110513	23.312		Tejendra Bahadur Shrestha (F)
540	72	32	102110513	95.122		Ram Pyari Shrestha (F)
541	73	32	102110513	2.896		Shyam Bahadur Shrestha (F)
542	74	32	102110513	40.232		Bishnu Bahadur Shrestha (F)
543	87	32	102110513	82.163		Su. Tirtha Bahadur Pradhan (F)
544	89	32	102110513	1377.909	Tukucha	
545	90	32	102110513	44.61	Road	
546	737	32	102110513	186.743	Road	
547	884	32	102110513	90.618		Society Guthi (F)
548	885	32	102110513	23.635		Society Guthi (F)
549	896	32	102110513	418.911	Balmiki Campus	
550	1132	32	102110513	41.921		Sanjeev Kumar Rimal (F)
551	1134	32	102110513	49.096		Kishori Amatya (F)
552	1136	32	102110513	29.441		Das Narayan (F)
553	1139	32	102110513	506.378		Udip Narayan Rimal (F)
554	1424	32	102110513	8.524	Baki (F)	
555	1461	32	102110513	46.885		Kriti Raj Upadhyaya (F)
556	1464	32	102110513	68.129	Baki (F)	
557	1465	32	102110513	48.806		Bal Krishna Neupane (F)

* NA = Not Available

(F) = derived From Fieldbook

S.N	PARCEL NO	WAR D NO	Grid	Area (Sq.m)	Remarks	Owner name
558	1800	32	102110513	8.604		Shyam Kumari Shrestha (F)
559	2006	32	102110513	14.634		Mohan Kumari Pandey (F)
560	2541	32	102110513	39.972		Dajip Giri (F)
561	2726	32	102110513	3.373		Himlaya Prasad Sharma (F)
562	2728	32	102110513	1.88		Upasarina Shakya (F)
563	2729	32	102110513	5.047		Balam Pradhanga (F)
564	2732	32	102110513	2.464		Puni Pradip Raj Pokhrel (F)
565	2733	32	102110513	7.87		Pramod Raj Pokhrel (F)
566	2734	32	102110513	7.342		Mala Gurung (F)
567	2748	32	102110513	9.528		Lal Shirey Bhumada Seni (F)
568	2751	32	102110513	10.454		Bindu K. C. (F)
569	2828	32	102110513	38.222		Mira Oli (Upreti) (F)
570	2829	32	102110513	6.113		Saurabh Den Bhatta (F)
571	2947	32	102110513	32.982	Baki Ja. Gha. (F)	
572	2948	32	102110513	20.205		Som Kumari Kharel (F)
573	3058	32	102110513	17.802	Bato (F)	Nepal Sarkar (F)
574	3066	32	102110513	16.806	Bato (F)	Nepal Sarkar (F)
575	3124	32	102110513	18.943	NA	
576	3174	32	102110513	5.151		Sudha Pathak (F)
577	3177	32	102110513	11.056		Kesam Simkhada
578	3322	32	102110513	4.582		Najma Banu (F)
579	3361	32	102110513	29.509	NA	
580	3604	32	102110513	52.259	NA	
581	50000	32	102110513	1.502	NA	

* NA = Not Available

(F) = derived From Fieldbook

4.5. Environment Protection Measures

To protect the river ecosystem from human interferences, following protection measures can be adopted:

- River training works can be provided to protect the river from changing its course and to prevent the river from damaging the surrounding land.
- Removal of existing sewer pipes from the river and installing new sewer system from the corridor leading to the sewage treatment plant downstream and safely discharging the treated water to the river stream.
- Plantation of trees across the river alignment. It will add beauty to the river stream as well as benefits the overall environment.
- Use of proper pavement material for effective ground water recharge and reduce possibility of flooding in the river.
- Environmental Impact Assessment can be done to identify the positive and negative impacts of the project.

4.6. Action Plan

From the study of the existing status of the river, it can be found that at many places where the river flows through settlements, river setback bye laws have not been followed. At some places, the buildings are built right to the edge of the river or boundary walls are constructed to the river edges which makes the river banks inaccessible. The illegal settlements will have to be removed and the land will have to be acquired and compensated in order to implement this proposed plan.

At segment from Narayanhiti path to Teendhara Marg, the river is underground buried beneath buildings. So it is much more challenging to free the river path in this section.

There are several restricted zones along the river path such as Embassy of People's Republic of China, Narayanhiti Palace Museum and Bhadrakali Army area. Due to security concerns in these restricted zones, the approval and implementation of the plan may be challenging.

It is a challenging task to implement this project as a whole. So, this overall task has been broken into three different phases.

- Immediate Action Plan
- Short term Action Plan
- Long term Action Plan

4.6.1. Immediate Action Plan

This includes works that can be completed within 2 years or less. Works under Segment VII and VIII (Ichchhumati Tarkari Bazaar and Bhrikutimandap) can be immediately brought to action as there are fewer complications. Properly managed vegetable market will ease the human traffic with the market and proper walkways and cycle lane will benefit both consumers and marketer of the vegetable market.

River bank along the Bhrikutimandap area can be utilized for open public park and urban vehicle parking space. Walkways and cycle lanes can be provided on both sides of the river. Multistoried parking can be provided on the large free space available which can be helpful in solving the current parking space problem in this region/

4.6.2. Short term Action Plan

This includes works that can be completed within 5 years or less. Under this plan, areas having free spaces can be utilized as per the preliminary design with walkways and cycle lanes on either side. Areas under Narayanhiti palace museum, Padma Kanya Campus, Thapathali Campus, Sankardev Campus can be developed for short term action plan. The restricted zones can be utilized under this short term action plan with required approvals. Narayanhiti palace Museum area can be used to develop public parks and vehicle parking areas as presented in the preliminary design. Area under Embassy of People's Republic of China can be used to develop walkways and cycle lanes. Similarly, area near Bhadrakali can be used to develop walkways, cycle lanes with book kiosks, open gardens in available pocket spaces.

Also spaces available along the river path near academic places like Thapathali Campus, Sankardev Campus and Padma kanya Campus can be used to provide walkways, cycle lanes with book kiosks. Public toilets are to be provided at every 500m at favorable spaces.

4.6.3. Long Term Action Plan

This includes works that could take more than 5 years due to various complexities. All the encroached areas should be the part of this long term action plan as it could take longer time to make the riverbanks free from encroachment. Construction works violating the 4m setback of the river will need to be demolished and the freed area can be utilized to implement the proposed designs. However, policies for compensation may need to be developed in order to acquire the needed land.

5. Cost Estimate

5.1. Land Acquisition Cost

Total Land Area	43234.705
Average Rate per aana	NPR 1,000,000.00
Rate per sqm	NPR 31,439.01
Total Compensation Amount	NPR 1,359,256,174.73

*Land Rate is assumed for preliminary estimate.

5.2. Preliminary Estimate

Following is the preliminary cost estimate of the project. For actual and detail breakdown of the cost estimate, another phase of design and study is required.

S. N	Description	No.	Length	Area	Rate	Cost	Remarks
			m	sqm	Nrs	Nrs	
1	Segment I						
a	4m Pavement	1	780	3120	5000	15,600,000.00	
b	Railing/barrier	2	780		4500	7,020,000.00	
c	Sewer	2	780		28982.5	45,212,700.00	
d	public toilet (5m x 10m)	1		50	37345	1,867,250.00	
2	Segment II						
a	Pavement	1	1015	4060	5000	20,300,000.00	
b	Railing/barrier	2	1015		4500	9,135,000.00	
c	Sewer	2	1015		28982.5	58,834,475.00	
d	public toilet	2		50	37345	3,734,500.00	
3	Segment III						
a	Pavement	2	475	3800	5000	19,000,000.00	
b	Railing/barrier	2	475		4500	4,275,000.00	
c	Sewer	2	475		28982.5	27,533,375.00	
d	Vehicle Parking Area	1		18320	5000	91,600,000.00	
e	Park	1		2190	2500	5,475,000.00	
f	public toilet	1		50	37345	1,867,250.00	
4	Segment IV						
a	Pavement	2	440	3520	5000	17,600,000.00	
b	Railing/barrier	2	440		4500	3,960,000.00	
c	Sewer	2	440		28982.5	25,504,600.00	

d	public toilet	1		50	37345	1,867,250.00	
5	Segment V						
a	Pavement	2	465	3720	5000	18,600,000.00	
b	Railing/barrier	2	465		4500	4,185,000.00	
c	Sewer	2	465		28982.5	26,953,725.00	
d	public toilet	1		50	37345	1,867,250.00	
6	Segment VI						
a	Pavement	2	295	2360	5000	11,800,000.00	
b	Railing/barrier	2	295		4500	2,655,000.00	
c	Sewer	2	295		28982.5	17,099,675.00	
d	public toilet	1		50	37345	1,867,250.00	
7	Segment VII						
a	Pavement	2	160	1280	5000	6,400,000.00	
b	Railing/barrier	2	160		4500	1,440,000.00	
c	Sewer	2	160		28982.5	9,274,400.00	
d	Vegetable Market Pavement	1			5000		
e	public toilet	1		50	37345	1,867,250.00	
8	Segment VIII						
a	Pavement	2	340	2720	5000	13,600,000.00	
b	Railing/barrier	2	340		4500	3,060,000.00	
c	Sewer	2	340		28982.5	19,708,100.00	
d	Open Park	1		8626	2500	21,565,000.00	
e	Vehicle Parking Area	1		3195	5000	15,975,000.00	
f	public toilet	1		50	37345	1,867,250.00	
9	Segment IX						
a	Pavement	2	355	2840	5000	14,200,000.00	
b	Railing/barrier	2	355		4500	3,195,000.00	
c	Sewer	2	355		28982.5	20,577,575.00	
d	public toilet	1		50	37345	1,867,250.00	
10	Segment X						
a	Pavement	2	660	5280	5000	26,400,000.00	

b	Railing/barrier	2	660		4500	5,940,000.00	
c	Sewer	2	660		28982.5	38,256,900.00	
d	public toilet	1		50	37345	1,867,250.00	
10	Miscellaneous						
a	Street Lights with Solar Panel	330			20000	6,600,000.00	
b	River training	2	4986		115000	1,146,780,000.00	
c	Land Acquisition					1,359,256,174.73	
d	Waste Treatment Plant					2,000,000,000.00	
				Total		NPR 5,165,111,449.73	

6. Conclusion and Recommendation

From this study, we can conclude that the river is exploited at many places as highlighted in the report by violation of river setback rules and the encroachment of the river itself. Addition of sewer pipes into the river further deteriorates the river environment. Therefore, it is highly recommended to free the river from the human encroachment and remove the settlements violating the river setback bye-laws. The 4m setback is recommended to be developed as walkway and cycle lanes on the both sides of the river which will free the river from congestion and also benefit the community. In places having large open spaces, those areas can be developed for city parking, open parks, vegetable market, book kiosks etc as presented in this report. Public toilets can be provided at every 500m of the river length and proper sewer lines can be installed to divert the existing sewers from the river to a proper treatment plan and thus reducing pollution in the river.

Detail Planning and designing will needed after approval from the concerned authorities to implement this plan into action. With proper co-ordination from all level of the government bodies, it is very much possible to transform this concept into reality.

ANNEX – I

DESIGNS AND DRAWINGS

ANNEX – II

SITE PHOTOS & 3D PICTURES

ANNEX – III

Plot Details – Land ownership & Field book

ANNEX – IV

Other Documents