

**POLONNARUWA
URBAN DEVELOPMENT PLAN
2019 - 2030
Volume I**



**Urban Development Authority
Ministry of Megapolis and Western Development**

POLONNARUWA
URBAN DEVELOPMENT PLAN
2019 - 2030

VOLUME I



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Ministry of Megapolis and Western Development

Polonnaruwa Urban Development Plan 2019 – 2030

Volume I

For Polonnaruwa Urban Development Area - Sri Lanka

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Polonnaruwa Urban Development Plan – 2019 - 2030 is delivered through a series of publication; Volume I and II. Volume I contain the situational analysis and the planning frame work of vision, goals, objectives, strategies and the strategic action projects and the implementation mechanism. Volume II is a separate document which contains both special, Planning and Building Regulations applicable to Polonnaruwa declared Urban area (Extra ordinary gazette No 2084/4 of 2018.08.14) within the period of 2019 – 2030. Polonnaruwa Urban Development Plan – 2019 -2030 was prepared by Polonnaruwa District Office with consultation of relevant stakeholder agencies.

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PREFACE

The city of Polonnaruwa, which has a rich history as the second kingdom of Sri Lanka, is a living proof of the excellence of ancient Sri Lankan town planning. During the reign of King Parakramabahu the Great, the city flourished in all aspects of economic, educational, health, social and security, while maintaining its natural beauty. It was also the center of what was called the "Eastern Granary".

The present city of Polonnaruwa serves as the main economic and administrative center of the district and is facing many problems of urbanization. Although the economy of the city and district is based on the rice industry as in the past, the urban population is raising the need for alternative economic opportunities.

Therefore, by scientifically analysing the existing problems, unused strengths and potentials in the Polonnaruwa urban area, the Polonnaruwa Urban development Plan has been formulated with a view to achieving the vision of the **“Green Glorious Heritage city in Kingdom of Rice”**.

The main objective of this plan is to create the physical environment necessary to restore the historical prosperity by providing new economic opportunities while preserving the ecological balance for the next 11 years in the Polonnaruwa urban area. It contains all the other objectives and strategic plans attached to it and will be valid until 31.12.2030.

Message from Honourable Minister



Having been established under the provisions of the Urban Development Authority Law: Act No. 41 of 1978, the Urban Development Authority by now have completed 40 years of service contributing to planned urban development in Sri Lanka. At this moment the UDA marks another milestone by completing a comprehensive Development Plans for 44 declared urban areas in Sri Lanka.

This development plan has been prepared for the implementation of the envisaged integrated development of the Polonnaruwa Urban area (Polonnaruwa Municipal Council and part of Polonnaruwa Pradeshiya Sabha) area. Polonnaruwa town which is the commercial centre and the administrative capital of the Polonnaruwa District, serves a large catchment of population. Further, the Polonnaruwa is a UNESCO world heritage city and its surrounding area possess a great historical value created by paddy cultivation showing a very high potential for tourism development.

Our effort is to support the entire Polonnaruwa District to be developed in par with the rest of the island by facilitating the appropriate physical environment. My understanding is that the preparation of this Plan involved extensive consultation with professionals, experts, stakeholders and the communities, while engaging modern methods, sound techniques and innovative approaches. In this regard, I appreciate the extraordinary efforts of the Chairman, Director General, Planning Team and all staff of the Urban Development Authority those who have contributed in numerous ways to successfully complete this work. I also appreciate the support and contribution of relevant local authorities, state and private sector agencies and general public by working equally on the same platform to make the Polonnaruwa Development Plan a success.

Patali Champika Ranawaka,
Minister of Megapolis and Western Development.

Message from the Chairman



Today, the Urban Development Authority (UDA) is the apex planning and plan implementation body in Sri Lanka that is responsible for managing the state of the urban environments of the nation. The Authority was established in 1978 with the objective of introducing integrated planning and implementation in order to promote and regulate the developments for the common benefit of all inhabitants of the urban areas.

Under the Amendment Act No 4 of 1982; (Part II section 8A [1]) the Urban Development Authority has been mandated to prepare Development Plans for the Urban Development Areas, declared by the Minister-in-charge. The development plan for Polonnaruwa Urban area has been prepared and enforced under such provisions. As a result of the declaration of the Polonnaruwa as an urban development area, the Urban Development Authority initiated the preparation of Polonnaruwa development plan considering physical, economic, social and environmental aspects of the Polonnaruwa Town and its surroundings.

For the implementation of this Plan, we have not forgotten that our path is not as smooth as silk, but as rough as gravel, full of challenges, filled with uncertainties, and fouled by vicious intents. Yet the UDA today is equipped with necessary systems, tools and strategies to face such challenges, withstand those uncertainties and to make the Polonnaruwa: the 'Green Glorious Heritage city in Kingdom of Rice'.

I take this opportunity to offer my sincere gratitude to the Team of the UDA who had to work hard and was committed to deliver this comprehensive work and also to all those who have supported and contributed with various means towards its formulation and hope the equal and continuous support of the all of them will be there towards its successful implementation.

Dr. Jagath Munasinghe,
Chairman, UDA

Polonnaruwa Mayor's Foreword



Polonnaruwa, a legacy of proud history of Sri Lanka's second kingdom, is currently undergoing rapid development under the "Awakening Polonnaruwa" District Development Program of His Excellency President Maithripala Sirisena. Similarly, the Polonnaruwa Municipal Council has launched a number of special projects in view of the vision of “*a sustainable city for a comfortable life*”.

In this background, the Urban Development Authority (UDA) has analysed the problems of the area and the development potentials for the next 11 years, envisioning the "Green glorious heritage city in kingdom of rice".

The plan aims to create new economic opportunities by highlighting environmental sensitive areas and ecological beauty and identity. I wish to thank the UDA for formulating a timely and practical plan, and I believe this plan will lead to a sustainable city for a comfortable life.

Chanaka Sidath Ranasinghe,
Mayor,
Polonnaruwa Municipal Council.

Polonnaruwa Pradeshiya Sabha Chairman's Foreword



Polonnaruwa is a historic city of perfect beauty. And the Polonnaruwa Pradeshiya Sabha is taking measures to bring all its people into a satisfying community.

In order to improve the well-being of the people, the Urban Development Authority has set up a plan for the Polonnaruwa urban area with the vision of "The Green glorious heritage city of the kingdom of rice ". It can be seen that a plan has been prepared for the Polonnaruwa urban area and met the timely requirements.

This plan has been prepared taking into consideration the potential issues and the potentials for solving the urban problems. It is happy to see that the plan leads to the economic development of the city with considering the maintenance of the ecological balance.

I wish to congratulate the UDA for the Polonnaruwa Town Development Plan which will enable the people of the area to move the right direction of development. also, I wish to give my fullest support with Polonnaruwa Pradeshiya Sabha for the Journey to future world with a new development vision and a timely Developmental competency.

Premasiri Munasinghe.

Chairman,

Polonnaruwa Pradeshiya Sabha.

ACKNOWLEDGEMENT

It is our proud privilege to express the feeling of our gratitude to H.E. Maithripala Sirisena, the president of Democratic Socialist republic of Sri Lanka for the clear guidance to prepare a practical plan to reborn the signifying history of Polonnaruwa city. And also express our gratitude to the Honourable Minister Patali Champika Ranawaka, Minister to the Ministry of Megapolis and Western Development.

Specially, we express our heartfelt and deep sense of gratitude to Mayor and its staff of the Polonnaruwa Municipal Council, Chairman and its staff of the Polonnaruwa Pradeshiya Sabha, Divisional secretary and its staff of Thamankaduwa Divisional Secretariat office for the extending their fullest support to successfully complete this Development Plan 2030 on behalf of the Urban Development Authority.

Exclusively We would like to express our special gratitude for residents, daily commuters, investors, foreigners, businessmen, and Grama niladhari officers of urban area for participation for the interviews, meetings with the vision to create Polonnaruwa to liveable and lovely city. And also, we would like to thank to all government and non-governmental organizations and their staff for giving the data and information to prepare and finalized this Plan.

Especially, we would like to express our gratitude to the Honour chairman Dr. Jagath Munasinghe for the attention and support given to prepare plan through the outcomes from the deep technology and practical studies by giving a new way of preparation of development plans in Urban Development Authority. And also, we would like to thank to Director General, Additional Director General, Deputy Director General, Director (Development Planning) of Urban Development Authority for extending their fullest support to successfully complete the Development Plan.

We also express our gratitude to Director and its staff of Environment and landscape Division, Director and its staff of Geo Information System Division, and Head and its staff of other Divisions of Urban Development Authority for the support given to successfully complete the Plan. Further, we express our special thanks to the all staff of Western Province Division for their fullest support to successfully complete the Development Plan.

TABLE OF CONTENT

PREFACE.....	iii
Message from honourable minister	iv
Message from the chairman.....	v
Polonnaruwa mayor's foreword.....	vi
Polonnaruwa Pradeshiya Sabha chairman's foreword.....	vii
Acknowledgement.....	viii
Table of content	ix
List of maps.....	xii
List of table.....	xiii
List of figures.....	xiii-xv
List of annexures.....	xvi
Acronyms	xvii

Part I

1. INTRODUCTION.....	1
1.1 Background of the Development Plan	2
1.2 Planning Team.....	3-5
1.3 Scope of the Work.....	6
1.4 The Planning Process	7
2. PRELIMINARY SURVEYS	
2.1 The Study Area	12
2.2 Planning and situational context	13
2.2.1 Historic evolution	15
2.2.2 National Significance	17
2.2.3 Ongoing Development Programme	18
2.2.4 As Commercial / Administrative and service Capital of District	18
2.2.5 Demographic Information	18
2.2.6 Housing	19
2.2.7 Economy of the City	19

2.2.8 Water Supply	19
2.2.9 Electricity and Telecommunication	19
2.2.10 Health	20
2.2.11 Education	20
2.2.12 Land Use of the City	21
2.3 Delineation of the Planning Boundary	21
2.3.1 The functional region	21
2.3.2 The geographic characteristic	22
2.3.3 The administrative divisions	22
3. NEED OF THE DEVELOPMENT PLAN.....	29

Part II

4. THE PLANNING FRAMEWORK.....	35
4.1 The Vision	36
4.2 Vision Statement	36
4.3 The Goals	36
4.4 Objectives.....	37
5. SWOT AND DETAIL ANALYSIS.....	39
5.1 SWOT for Goal (1)	40
5.2 SWOT for Goal (2)	50
5.3 SWOT for Goal (3)	63
6. THE PLAN.....	73
6.1 Introduction	74
6.2 Concept Plan.....	75
6.3 Proposed Land Use Plan.....	77

6.4 Strategies.....	81
6.4.1 Economic Development strategy	81
6.4.1.1 Identification of main Economic Drivers and Predictions	81
6.4.1.2 Proposed Economic Strategic Plan	82
6.4.2 Culture and Heritage Management Strategy.....	94
6.4.2.1 Heritage Areas	94
6.4.2.2 Goals related to culture and heritage management strategy	95
6.4.2.3 Proposed culture and heritage management strategic plan	95
6.4.3 Social and Physical Infrastructure Development Strategies.....	104
6.4.3.1 Service Plan	104
6.4.3.2 Strategic Transportation Plan	109
6.4.3.3 Water supply Strategic Plan	114
6.4.3.4 Electricity and data lines	117
6.4.3.5 Strategic Plan for the Drainage and sewer line	117
6.4.3.6 Waste management Plan	119
6.4.4 Environment Sustainable Strategies.....	121
6.4.4.1 Conservation Plan	121
6.4.4.2 Landscape Management Plan	122
6.4.4.3 Public Open Space Plan	123
6.4.4.4 Prepare Public Outdoor Recreational Space (PORS) Plan in 2030	124
6.4.4.5 Disaster Risk Management Plan	131
6.4.4.6 Agriculture plan	134
6.5 Linkages Between other strategies.....	137
6.6 Implementation Strategy.....	137
6.6.1 Strategic Action Projects	138
6.6.1.1 First priority Projects	143
6.6.1.2 Second priority Projects	145
6.6.1.3 Third priority Projects	146
6.6.1.4 Few Strategic Action Projects with More Detail	147
7. ANNEXURES	174

List of Maps

Map 2.1:	Location map of the Planning Boundary.....	14
Map 2.3:	Planning Boundary Demarcation with Gns.....	23
Map 2.4:	Connectivity and settlement pattern of districts.....	24
Map 2.5:	Integration (closeness) of the area according to network.....	24
Map 2.6:	Development Pressure Analysis.....	25
Map 2.7:	Livability Analysis in Polonnaruwa Planning area.....	26
Map 2.8:	Sensitivity Analysis in Polonnaruwa Planning area.....	27
Map 2.9:	Potential Analysis in Polonnaruwa Planning area.....	28
Map 5.1:	Solid waste collection route of Polonnaruwa MC.....	65
Map 5.2:	Drainage Network.....	67
Map 6.1:	The Concept Plan.....	76
Map 6.2:	Proposed Land use	80
Map 6.3:	Tourism Strategic plan.....	85
Map 6.4:	Location of viewing desk and paddy for enjoy.....	87
Map 6.5:	Irrigation Museum, Old paddy village and paddy museum.....	89
Map 6.6:	Alternative tourist routes at the city.....	90
Map 6.7:	Proposed Economic Projects.....	93
Map 6.8:	Culture and Heritage plan.....	102
Map 6.9:	Health institutions in Polonnaruwa.....	105
Map 6.10:	Proposed service plan.....	107
Map 6.11:	Settlement plan.....	108
Map 6.12:	Strategic Transport Plan.....	113
Map 6.13:	Water Supply in Polonnaruwa planning area.....	115
Map 6.14:	Water supply plan.....	116
Map 6.15:	Drainage Strategic Plan.....	118
Map 6.16:	waste treatment plant Gallella.....	120
Map 6.17:	Public Outdoor Recreational Space (PORS) Plan in 2030.....	126
Map 6.18:	Proposed Disaster Risk Reduction Zoning.....	133
Map 6.19:	Agriculture plan.....	136

List of Tables

Table 5.1:	SWOT for Goal 01.....	40
Table 5.2:	Tourist arrival to Polonnaruwa.....	50
Table 5.3:	Average yield per hectare.....	51
Table 5.4:	Paddy Production of Sri Lanka.....	52
Table 5.5:	Imports and export rice.....	59
Table 5.6:	SWOT for Goal 2.....	60
Table 5.7:	SWOT for Goal 3.....	63
Table 5.8:	Solid Waste Collection routes of polonnaruwa MC.....	65
Table 5.9:	Water treatment plants in polonnaruwa Urban area by NWS&DB.....	71
Table 5.10:	Disaster Events, Thamankaduwa DSD, from 2006-2017.....	72
Table 6.1:	Predictions related to the economy.....	82
Table 6.2:	Existing PORS – 2018.....	124
Table 6.3:	Proposed Public Outdoor Recreation Space Plan 2019 - 2030.....	125
Table 6.4:	Strategic Action Projects.....	138
Table 6.5:	First priority Projects.....	143
Table 6.6:	Second priority Projects.....	145
Table 6.7:	Third priority Projects.....	146

List of Figures

Figure 1.1:	Planning process.....	07
Figure 2.1:	Conceptual drawing of Old city by A.D.N. FERNANDO in 1978.....	15
Figure 5.1:	Heritage cites in Sri Lanka.....	42
Figure 5.2:	Components and their relative positions in the small tank system in Sri Lanaka.....	43
Figure 5.3:	Map of ruins in polonnaruwa sacred city.....	44
Figure 5.4:	Royal Auditorium of King Parakramabahu.....	46
Figure 5.5:	7th story Palace of King Parakramabahu.....	46
Figure 5.6:	The Polonnaruwa Moonstone.....	46
Figure 5.7:	Nishshanka Latha Mandapaya.....	46
Figure 5.8:	Letters in King Parakramabahu's era.....	47
Figure 5.9:	Coins in King Parakramabahu time.....	47
Figure 5.10:	Polonnaruwa Quadrangle.....	47
Figure 5.11:	Development concept for urban centre.....	48

Figure 5.12:	Proposed projects of Pibidemu Polonnaruwa Development Programme	49
Figure 5.13:	Some Hotels and facilities in Polonnaruwa.....	50
Figure 5.14:	Famous travelling routes of Sri Lanka - Foreign Tourists.....	51
Figure 5.15:	Accommodation Concentration around Sri Lanka.....	51
Figure 5.16:	Paddy Production of Sri Lanka 2016 Maha Season.....	52
Figure 5.17:	National Parks at Closer proximity.....	53
Figure 5.18:	Beautiful locations within urban area.....	53
Figure 5.19:	No. of visitors at National Parks in Sri Lanka.....	54
Figure 5.20:	Road network of the planning area	54
Figure 5.21:	Distribution of tourist by purpose of visit 2006 - 2016.....	56
Figure 5.22:	No of Visitors in main heritage cites.....	56
Figure 5.23:	Occupancy rates by resort region 2015 - 2016.....	57
Figure 5.24:	Paddy related agri tourism in Vietnam.....	59
Figure 5.25:	Sustainable Development Targets.....	62
Figure 5.26:	Type of waster colleting from Polonnaruwa.....	64
Figure 5.28:	Drinking water usage.....	66
Figure 5.29:	Photographs on existing drainage.....	68
Figure 5.30:	The air direction of city in May to August (Yala monsoon).....	68
Figure 5.31:	Actual temperature and real feel.....	69
Figure 5.32:	The heat island profile source.....	69
Figure 6.1:	Section AB.....	77
Figure 6.2:	Section CD.....	78
Figure 6.3:	Section EF.....	78
Figure 6.4:	Cross sections of the city – 2030.....	79
Figure 6.5:	Star class hotel which blend with nature, Chena Huts by Uga Escapes Yala /Sri Lanka.....	83
Figure 6.6:	Fishing at Parakrama Samudraya.....	83
Figure 6.7:	Swan boat service at Gregory lake, Nuwaraeliya.....	83
Figure 6.8:	Dock less bike sharing.....	84
Figure 6.9:	The big muskie at the Freshwater Fishing Hall of Fame in Hayward, Wisconsin.....	84
Figure 6.10:	Kids Freshwater Fishing Derby.....	84

Figure 6.11:	Agri Tourism recreational activities.....	86
Figure 6.12:	Viewing Deck.....	87
Figure 6.13:	Japan's Paddy art in Inakadate village, japan.....	88
Figure 6.14:	Drafted Kaduruwela fortress using Google satellite image 2010.....	96
Figure 6.15:	Entrance points and main nodes to be develop as Land marks of Polonnaruwa.....	97
Figure 6.16:	Examples for suitable Antient structures.....	97
Figure 6.17:	landmark For Node at Kaduruwela Polonnaruwa Massa coin.....	98
Figure 6.18:	need cycling friendly infrastructure.....	99
Figure 6.19:	Solar lighting facilities in Parakrama Samudra bund.....	99
Figure 6.20:	Ulpotha village Dambulla.....	100
Figure 6.21:	Ruins in Polonnaruwa sacred city.....	103
Figure 6.22:	Pedestrian Facilitating.....	111
Figure 6.23:	Proposed Kaduruwela Alternative road and three parking slots.....	112
Figure 6.24:	Gallella Narrow Bridge.....	112
Figure 6.25:	Tree plantation middle of the road.....	123
Figure 6.26:	Vegetation cover at the outdoor space and building.....	123
Figure 6.27:	Vegetation cover at the roof top.....	123
Figure 6.28:	Vegetation cover at the outdoor space and building.....	123
Figure 6.29:	Four alleyways from paddy's to A11 road.....	123
Figure 6.30:	Location map of Kaduruwela Urban park.....	127
Figure 6.31:	Examples for urban park.....	128
Figure 6.32:	Location map of Kaduruwela Urban park.....	128
Figure 6.33:	Location map of proposed Wetland Park in Gallella.....	129
Figure 6.34:	Present name board of sanctuary.....	130
Figure 6.35:	Beddagana Wetland park walkways.....	130
Figure 6.36:	Boat Travels in Mahawali River.....	130
Figure 6.37:	Deepa uyana extension project- conceptual master plan.....	130
Figure 6.38:	Deepa uyana extension project- conceptual Section plan.....	131

List of Annexures

Annexure 1:	Approved Pibidemu Polonnaruwa Development projects 2017.....	175
Annexure 2:	Monthly rainfall in Polonnaruwa District 2009-2015.....	176
Annexure 3:	Monthly temperature of Polonnaruwa District 2010-2015.....	176
Annexure 4:	Terrain map of Polonnaruwa Urban area.....	177
Annexure 5:	Urban Hierarchy - North central province.....	178
Annexure 6:	Polonnaruwa City Catchment.....	178
Annexure 7:	Health institutions in Planning Area 2018.....	179
Annexure 8:	District wise Population distribution -Sri Lanka 2012.....	180
Annexure 9:	Population growth by District 1981-2012.....	181
Annexure 10:	Religious places distribution of Planning Area 2018.....	182
Annexure 11:	Poverty Indicator by sector, province and district.....	183
Annexure 12:	Monthly income of a family Polonnaruwa Planning area 2017.....	184
Annexure 13:	Labour Force under each employment category.....	184
Annexure 14:	Employment of each sector in Planning area.....	185
Annexure 15:	Unemployment rate by district in 2011-2016.....	185
Annexure 16:	Economically active population by Districts in 2016.....	186
Annexure 17:	Water supply of Planning Area 2018 by National water supply and drainage board.....	187
Annexure 18:	Hydrology network in Polonnaruwa Planning area 2018.....	188
Annexure 19:	Electricity supply in planning area.....	189
Annexure 20:	Land Value of Planning area - 2018.....	190
Annexure 21:	Schools and other educational institutions in planning area.....	191
Annexure 22:	Land use of planning area 2018.....	192
Annexure 23:	Tourist arrival to Polonnaruwa in 2017.....	193
Annexure 24:	Existing Road network and traffic Congestion.....	194
Annexure 25:	Existing Parks & Playground in Polonnaruwa Urban Area – 2017.....	195
Annexure 26:	Proposed Public Outdoor Recreational Space Plan for Polonnaruwa Urban Area – 2030.....	196
Annexure 27:	Proposed infrastructure development projects in sacred area.....	197

Acronyms

UDA	-	Urban Development Authority
GND	-	Grama Niladhari Division
NPPD	-	National Physical Planning Department
DSD	-	Divisional Secretariat Division
LA	-	Local Authority
PDP	-	Polonnaruwa Development Plan
FAR	-	Floor Area Ratio
CCF	-	Central Cultural Fund
NWSDB	-	National Water Supply and Drainage Board
PMC	-	Polonnaruwa Municipal Council
PPS	-	Polonnaruwa Pradeshiya Sabha

CHAPTER 1: INTRODUCTION



1. INTRODUCTION

1.1 Background of the Development Plan

Urban Development Authority is the regulatory body of the urban development of Sri Lanka. Thus, it has been empowered to function as the key urban planning implementing agency in the country by Urban Development Authority act no 41 of 1978. And this Polonnaruwa Urban Development Plan has been formulated as per the powers and functions vested with the Authority under section 8 of the Urban Development Authority (Amendment) Act, No.4 of 1982. The authority's mission is to Promote Integrated Planning and implementation of the economic, social, environment and physical development of the declared urban areas. The above ambitious are framing the main objective of preparation of this development plan.

The study area of this development plan located in Polonnaruwa Municipal Council and selected Grama Niladhari divisions in Polonnaruwa Pradeshiya Sabha area of Polonnaruwa district in North central province of Sri Lanka. Polonnaruwa Town Council area has been declared as an Urban Development Area in extra-ordinary gazette notification no 38/16 of June 10th 1979. Yet again in 2005 Selected 22 GN divisions of Thamankaduwa Pradeshiya Sabha (56.7 sqm) have been declared as Urban Development Area by extra-ordinary gazette notification no: 1397/1 in 13/06/2005 and It has been practised a drafted development plan from 2008 to 2018 for above area.

By gazette notification of 19-12-2016, Thamankaduwa Pradeshiya Sabha declared into two local authorities named “Polonnaruwa Municipal Council” (18 G N divisions) and “Polonnaruwa Pradeshiya Sabha” (remaining 37 GN divisions) by the Ministry of Local Government. Hence With that background by analysing urban development trends and development pressure Urban Development Authority again declared total 34 Grama Niladhari Divisions as Urban Development area in 2018. That's became the Planning boundary for 2019 -2030 Polonnaruwa urban development plan.

The Report contains overall framework for planning physical development in Polonnaruwa urban area for the period of 2018-2030. Consequently, the plan 2030 is to promote and regulate the integrated planning and physical development of lands and buildings in Polonnaruwa urban area and to establish facilities, amenities and service-

related infrastructure for the betterment of residents and commuters of Polonnaruwa. This urban Development Plan shall be reviewed in ten years for needy updates and amendments.

1.2 Planning Team

Main Stakeholders

- Polonnaruwa Municipal Council
- Polonnaruwa Pradeshiya Sabha

Main Consultancies

- Department of Census and Statistics
- Central Cultural Fund
- Department of Archaeology
- Sri Lanka Tourist Board
- Department of Irrigation
- Department of Agrarian Development
- Department of National Physical Planning
- Presidential Secretary Office for “Pibidemu Polonnaruwa Development Program”.
- Department of Meteorology
- Board of Investment of Sri Lanka
- Central Environmental Authority
- Department of Agriculture
- National Water Supply & Drainage Board
- Department of Forest
- Department of Railways
- Road Development Authority
- Land Use Policy Planning Department
- Department of Wildlife Conservation
- Disaster Management Centre Polonnaruwa
- Ceylon Electricity Board
- Hector Kobbkduwa Agrarian Research & Training Institute
- Mahaweli Authority of Sri Lanka
- Sri Lanka Police

- Department of Survey
- Industrial Development Board

Other Relevant Stakeholders

- District Secretary Office - Polonnaruwa
- North Central Provincial Council - Anuradhapura
- Grama niladhari Officers of urban area.
- Most Venerable Wendaruwe Upali Maha Thero, Galviharaya Temple, Polonnaruwa
- Most Venerable Udagama Dhammananda MahaThero, Isipathanarama Temple, Polonnaruwa
- Most Venerable Kaduruwela Dhammapala MahaThero, Jayanathi Temple, Kaduruwela, Polonnaruwa.
- Main Maulvi, Jumma Mosque, Kaduruwela
- The Very Reverend Father Norbert Marshal Andrade, Nirmalee Church, New town, Polonnaruwa.
- District Director, District Samurdhi office, District Secretariat, Polonnaruwa.
- Secretary, Chamber of Commerce Polonnaruwa Group, Studio Nalani, Main Road, Kaduruwela.
- President, Sanasa Society, Jayasewana, Kaduruwela, Polonnaruwa
- President, Pragathi three-wheelers society, Hospital Junction, Polonnaruwa.
- Manager, Peoples Bank, regional office, Polonnaruwa.
- Manager, Bank of Ceylon, regional office, New Town Polonnaruwa.
- Manager, Sampath Bank, Kaduruwela, Polonnaruwa.
- Owners of Large & Small-Scale Rice Mills, located in Polonnaruwa urban area.

Urban Development Authority, Polonnaruwa District Office Planning Team

- Plnr.L.J. Liyanage - Director, North Central Province
- Plnr.D.B.S.K. Disanayake - Deputy Director (Planning)
- Plnr. W. A. R. Ranjani - Deputy Director
- Plnr. T.J.K. Jayalath - Strategic Planner
- Ms. M.H.I.S. Gunarathna - Strategic Planner
- Ms. R.D.S. Sumathipala - Enforcement Officer
- Mr.H.M.G. Bandara - Enforcement Officer

Urban Development Authority Head Office Supportive Teams

- Geographical Information System and Planning Support Division for preparation of Polonnaruwa Geo data base.
- Research and Development Division for spatial analysis works
- Development Planning Division for stakeholder meetings and overall guidance in preparation of Development Plan
- Landscape Planning Division for preparation of Supportive Sub Plans in Development Plan

1.3 Scope of the Work

Urban Development Authority is promoting and regulating the urban development process in order to facilitate the growth of the economy, protecting the natural and built heritage and improving the quality of life of all inhabitants.

Accordingly, Polonnaruwa Urban development plan 2030 is aiming mainly at the physical development aspects of the area to achieve the integrated planning targets. The physical developments include changes in the land uses, establishment and extension of settlements, shifting and location of human activities, installation and improvement of physical infrastructure, conservation and enhancement of any land-based heritage or resource, etc. Any other development which haven't direct implications upon the physical environment of the area may not be covered within the scope of this Development Plan.

When preparing urban development plan 2030, it has been considered drafted development plan 2008-2018. The main planning concept and many action projects of draft development plan 2008-2018 has been selected to implement under 'Pibidemu Polonnaruwa District Development Programme' by presidential secretariat office. The programme itself planned district level social economical and physical infrastructure development projects and overall district level development. consequently, the Polonnaruwa Urban area is getting higher impact as the capital city of the district.

Directly addressed urban issues by above programme and projects which are already at implementing stage and their future impacts have been incorporated in preparation of new urban development plan and avoided repetition with the proposed projects.

1.4 The Planning Process



Figure 1.1: Planning process

Source : UDA District Office Polonnaruwa

1.4.1 Background Studies

For the background studies in 2017 March collected Data on main 4 aspects as social, physical, environment and economy of Polonnaruwa through Surveys, Office visits, Internet, Drone Survey, Google maps, Satellite, Archives etc. It included information on Population, Land use, Economy, Industry, Agriculture, Housing, Health, Education, Roads, Transport, Infrastructure, Archaeology and Heritage, Special Projects, Open Spaces, etc.

After collection of Satisfactory Level Primary Data & Secondary Data in 2017 July it has done Basic analysis using IT technology such as Excel, Arc GIS, Drone based software, Google maps, SPSS to know the present states of the city.

1.4.2 Scoping

Conceptual framework

To scope up the development plan it has selected key areas to consider. Those are Historical background of the city, previous planning attempts and their gaps, Local, Regional, National & International Level Importance and Linkages of Polonnaruwa city and The National Physical Plan & Policy 2017-2050 of Sri Lanka.

Physical frame: Delineation of planning boundary

After analysing urban development trends and development pressure and untapped potentials of the city, it has been selected total 34 Grama Niladari divisions to be declared as Urban Development area for future development plan. As a result, by extraordinary gazette No 2084/4 on 14th August 2018 gazetted the new urban area and considered as Planning boundary of this development plan.

1.4.3 Problems & Potentials Identification

To deliver a practical and successful urban development plan it must identify the Problems & Potentials of the area intensely. It has done in two ways as Identification of them in Planners view with analysed information and identify the distinct perspectives of Problems & Potentials in stakeholders' view. For that purpose, Conducted Stakeholder meeting in 28th of September 2017 with government and non-government organizations with NVIVO Analysis facility. Further conducted series of interview with commuters, residents' and even grassroots level community.

1.4.4 Vision & Goals Formulation

Problems and Potential Approach

It has been categorized total threshold population in to four groups to Frame the problems and potentials based on Context, Magnitude & Significance. Those are Polonnaruwa residents and Famers, Daily commuters, foreign tourists and Other Sri Lankans / Local travellers.

Then given weight to each problem as high, moderate and low based on the effects to selected Groups one by one. Then got the list of prioritize problems and potentials. It could identify some potentials could address the problems and accordingly finalized the problems and potentials to be address through Polonnaruwa Urban Development Plan.

Development Trend Approach

With the scope of National Physical Planning Policy 2030 and ongoing 'Pibidemu Polonnaruwa Development Programme 2015-2020 and 2030 Agenda for Sustainable Development by the United Nations Sustainable Development Summit on 25th September 2015 identified the ways that should attend to the problems and potentials we have selected to address in development plan.

Public Stakeholder View Approach

Conducted interviews with all type of stakeholders to know “The image of the city which they like to see and space which they like to experience in 2030”.

With above three approached moulded the vision of Polonnaruwa urban development plan 2030. In order to achieve the vision separated it in to 3 goals.

1.4.5 Detail Analysis (based on Goals and Objectives to achieve the Vision)

For each goal identified Strength, Weakness, Opportunities and Threats and details on facts. Done some detail analysis with Strength, Weakness, opportunities and threats with the support of Liveability Analysis, Potential Analysis, Sensitivity Analysis. Then Finalized objective based on details of each goals.

1.4.6 The Plan: Strategy Formulation

Detailed analysis of Economic, Social, Physical & Environmental factors transforms in to urban development practical process as strategies to achieve the Vision.

1.4.7 The Plan Regulations

In 2018 September Made Zoning regulations with boundaries, Planning & Building Regulations, General Regulations, Special Regulations, Guide plan Regulations, establish in relation to above plans within relevant urban development area. Introduce new method in Categorized zones considering target development trend, expected efficiency of land use in the area.

1.4.8 Consent

Got consent in two ways. Draft Development Plan presented to UDA Professionals and got Final comments and views from UDA Professionals in 2019 April.

Forward the Draft Development plan to public comments and Local Authority consent by Keep the Draft Development Plan in Polonnaruwa Municipal Council and Polonnaruwa Pradeshiya Sabha from 2019 February to April (60 days) for Public Awareness. and Conducted Stakeholders Awareness Workshop (Workshop no. 2) to both Local Authorities in 14th of February 2019.

1.4.9 Submission

The amended plan with UDA main planning Committee and two local authorities submitted to the development planning division of UDA in May 2019.

1.4.10 Approval & Publishing

The subject Minister approved and gazette the plan in three language in June 2019.

CHAPTER 2. PRELIMINARY SURVEYS



2. PRELIMINARY SURVEYS

2.1 The Study Area

Polonnaruwa urban area is located within Polonnaruwa district in North central province of Sri Lanka. It is known as one of the cleanest and more beautiful cities in the country among the foreign tourists. The green environment, nourished paddy fields, amazing ancient constructions, huge lakes like Parakrama Samudra, makes an unforgettable and unique experience. For the locals the name *Polonnaruwa* memorize with ruins, Pulasthi statue, green paddy field with lakes and big channels, wild elephants and hot temperature or the droughts.

The planning area consists of total 34 Grama Niladari divisions and those are falling into two local authorities namely 18 Grama Niladhari divisions in Polonnaruwa Municipal Council and 16 Grama Niladhari Divisions in Polonnaruwa Pradeshiya Sabha area.

Polonnaruwa Town Situated in 216 Kms away from Colombo and 122kms from Kurunegala. The most popular rout to reach Polonnaruwa is to come to Habarana and then turning off along A-11 Road (Maradankadawala – Trikkonamadu) and 45 km to the city through Passing Minneriya National Wildlife Park. If comes via railway Colombo – Batticaloa rail route is located through the Polonnaruwa City since 1928 (Colombo, Maho Junction, Galoya Junction, Polonnaruwa and Batticaloa) and it resulted the Commercial capital of Kaduruwela from 1950's.

Although Polonnaruwa well Connect with *A class* Roads and rail route to surrounded district capital cities such as Dambulla, Anuradhapura, Batticaloa, Mahiyanganaya, Ampara, to enter to the city in any direction it needs to pass natural barriers like forests and rivers. Because of that, the city was a hidden kingdom throughout the history.

The district has Tropical climate characteristics and falls to dry zone of the country with average annual rain fall 1678 mm (Annexure 02). The average annual temperature is 27.3 °c and May is the warmest month with averages 30 °c. January has the 25.1 °c as lowest average temperature of the year (Annexure 03). The district topography varies from 50ft - 500ft average height from mean sea level and comparatively flat terrain with low slope (Annexure 04).

2.2 Planning and situational context

Presently according to the North central province urban hierarchy, Polonnaruwa is the second order city while Anuradhapura City is the 1st order city (Annexure 05). City has been declared as a town council from 1979 and changed the urban area boundaries consequently over the years.

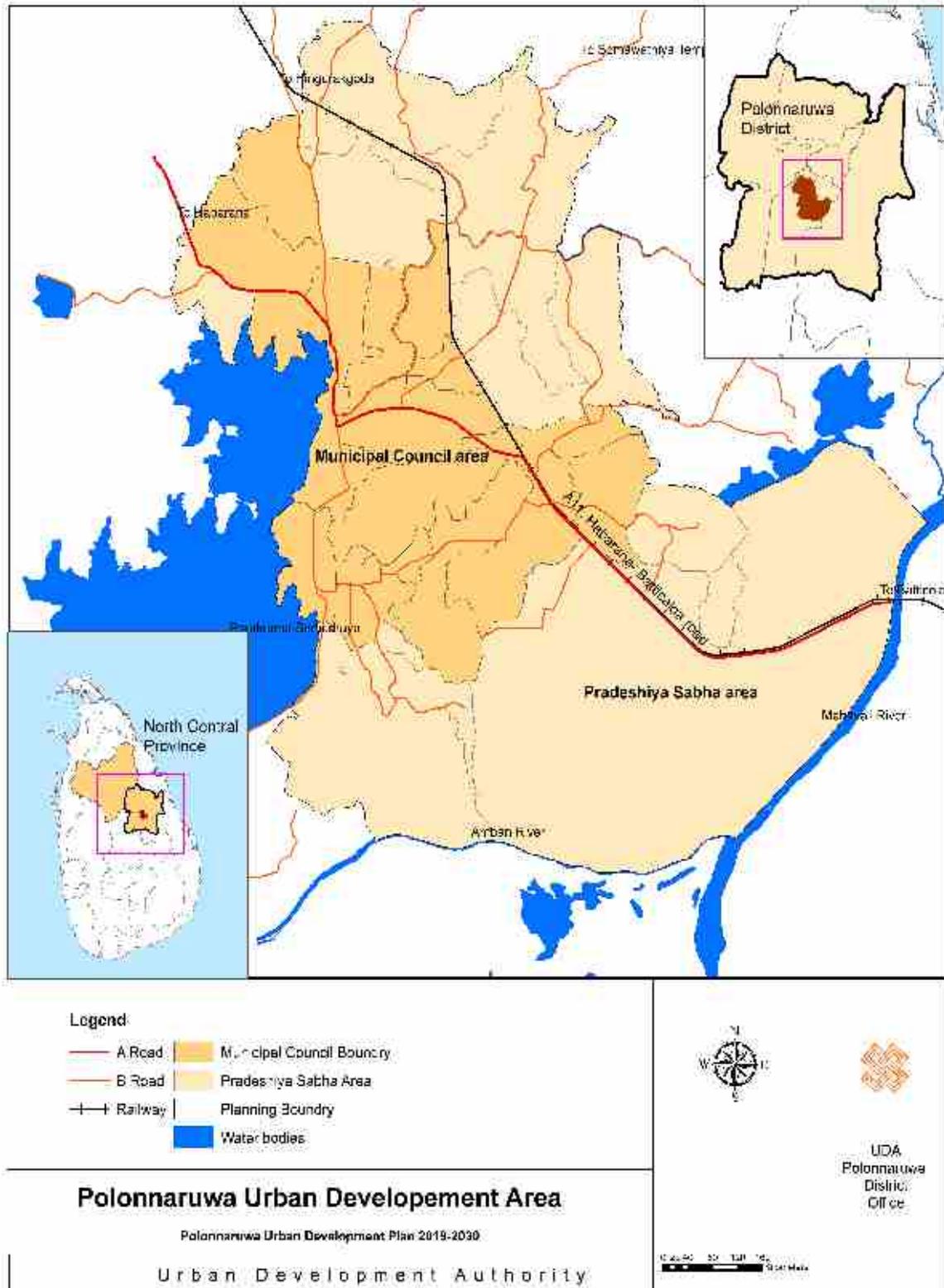
At present according to the National Physical Planning Policy (NPPP) 2017-2030/ 2050 the role of the city altered. The National Physical Policy and plan has been formulated in 2006 and revised for the time of 2017- 2050 by National Physical Planning Department. According to the NPPP & plan, the physical developments of the country is expected to be concentrated into four 'Development Corridors', two 'Metro Regions' and the nine 'Main Cities'. **Polonnaruwa is a one from Main nine Cities.** NP plan described main cities as follows.

A 'Main City' is a comparatively larger concentration of economic activities, urban facilities and residential population, and serves as the higher order service centre to a reasonably large land area. Within this policy, a 'Main City' shall be defined as an area with a minimum population of 100,000, and a gross residential population density of more than 5,000 persons per square kilometre. (Section 2.3.1. / NPPD revised plan 2017-2050 / National Physical Planning Department)

With the natural growth (According to the Analysis) Polonnaruwa urban area will only reaches to 77000 populations in 2030 and density will not match with target of NPPP plan. But Polonnaruwa urban area will match other criteria's as a main city. While preparation of an urban development plans the given target is needed to consider.

Whole urban area is mostly functioning at 6 am to 7 pm of the day. Although the city is a district capital and a bypass centre for All road the night time activities are very less.

Polonnaruwa Urban Development Area



Map 2.1: Location map of the Planning Boundary

Source : UDA District Office Polonnaruwa

2.2.1 Historic evolution

Polonnaruwa is a famous ancient kingdom within Sri Lanka which can be clearly seen looking at all the ruins. The entire area consists of many historical places that you can explore by bike, foot or by tuk-tuk. Since the Polonnaruwa city is a historical land mark in the country and the existing formation of the city is a result of historical actions it needs to have profound understand in preparation of urban development plan.

The story of the area begins before arrival & settlement of Arians (13000 years ago) to Sri Lanka. There is evidence for the civilization with paddy cultivated people along Mahaweli River in king Rawana's time. It's a belief that the famous statue in Pothgulvihara can be the “Pulathisi Rishi” the grandfather of King Rawana's whom the principal of *Pothgul vihara ashram* located in river bank of Mahaweli. (*J. Balasooriya, 2007, 1st edition, Mahaweliya and historical Polonnaruwa, ISBN 955-96585-8-1*).

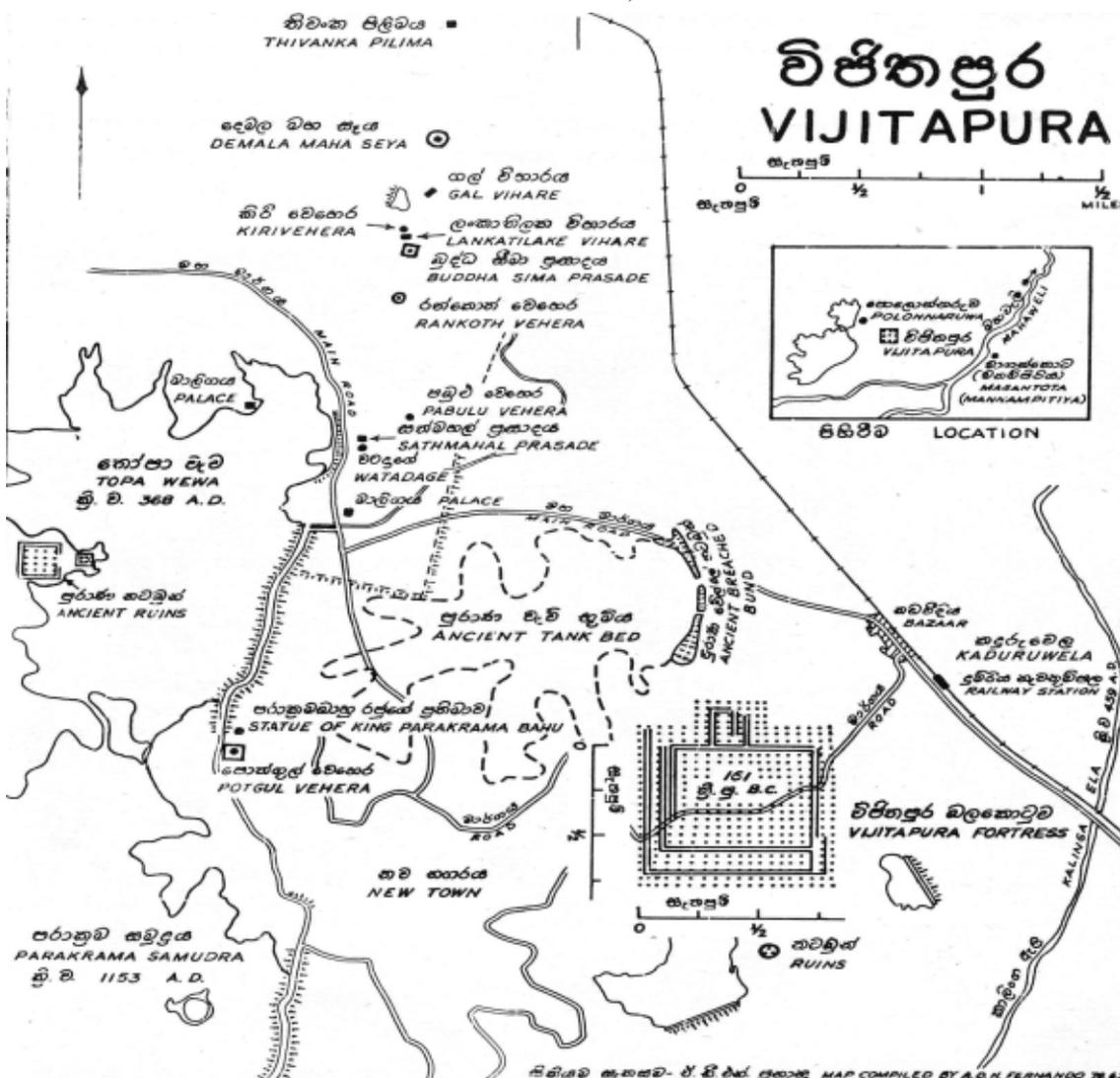


Figure 2.1.: Conceptual drawing of Old city by A.D.N. fernando in 1978
 Source: (*J. Balasooriya, 2007, 1st edition, Mahaweliya and historical Polonnaruwa, ISBN 955-96585-8-1*)

The well written history began with arrival & settlement of Arians. Anuradhapura kingdom time “Baddhakachchya princess's brother settled in the Mahaweli river bank and made a village called “Vijithagama” (at present it's nearby Kaduruwela town). There was a well-planned and sustainable fortress called “vijithapura” belongs to king Elara's in 161 Bc. King “Dutugamunu settled to fight with Vijithapura, camping in a paddy field which presently known as Kaduruwela commercial city. It resulted the name of town as Kandawurubandiwela, Kandawuru –wela to Kaduruwela. (J. Balasooriya, 2007, 1st edition, Mahaweliya and historical Polonnaruwa, ISBN 955-96585-8-1)

658 BC Polonnaruwa became the Second kingdom of Sri Lanka Started with king iv Agbo. The golden era of Polonnaruwa started with King Maha Parakrama Bahu in 1153-1186 Bc.

King Maha Parakramabahu's time the city centre was a well-planned and sustainable healthy city with three gardens inside namely Nandana Uyayan, Laksha Uyana, and Deepa Uyana. New Buddhist vihara constructions like Alahana Piriwena, Lankathilakaya, Thuparaamaya, Kiriwehera, Jethawanaramaya made the cultural and educational richness. More than 2000 lakes, canals and irrigation systems made the famous named of Sri lanka as “Granary of the east”. The story for above are still witnessing in the Polonnaruwa sacred city.

In 1187-1196 King Nishshankamalla build many beautiful buildings which made a unique identity within the city.

In 1214 BC Polonnaruwa kingdom abandoned with 'Kalinga Maga's 40 years activities. Then Polonnaruwa acted as a sub district in other kingdom times and played vital role as a battle ground when necessary for changes in kingdoms. 1815 Kandiyani agreement signed by “Thamankaduwa Disawe” was the leader of Polonnaruwa at the time. Likewise, there are enough evidence throughout the history that Polonnaruwa wasn't fully abandoned.

Afterward Kandyan kingdom the British ruled period and Post-colonial period had a great influence in city evolution. It couldn't find any written documentation on overall planning of the city. But with closer look with establishment of several important organizations it can imagine how the city evolved to existing situation.

In 1870 British government Made a Circuit Bungalow for British government agents (GA) at the Bund of Parakrama Samudra Lake and presently it's converted to LKHO lake House hotel and is one of a 3 - star hotel in Polonnaruwa hotel classification. In 1922 Manampitiya

steel bridge was built to connect eastern part of the country with a railway line. It's the second longest steel bridge in Sri Lanka with 302 m. 1927 Railway station of Polonnaruwa and Post office started at Kaduruwela and it resulted the evolution of commercial centre. in 1958 Polonnaruwa Hospital started as rural hospital controlled under Mathale health director's office and rapidly changed the land use in hospital junction. The evolution of administrative centre started in 1961 with 'Thamankaduwa Kachcheriya' built for administrative purpose of Thamankaduwa pattuwa and Sinhala Pattuwa. The new town area highly influenced by construction of royal central college in 1959 with lager land extent and started its function from 1965. The Ceylon water board established in same year at new town. The Ceylon Transport Board started with 5 buses in 1969 and now the transport network function with 16 routs and more than 869 trips daily. There are SLTB 148 buses and privet 178 buses.

2.2.2 National Significance

Polonnaruwa has national significance in two ways.

- I. After declaration as UNSCO World Heritage city from 1982 it is a popular heritage tourist destination in Sri Lanka. According to Central Cultural Fund Statistic 180,000 foreign tourists arrived in 2016.
- ii. Polonnaruwa is the Premier Paddy producer in the country for centuries. According to Paddy Statistics –2018 Yala Season by Department of Census and Statistics Sri Lanka. The largest extent of paddy cultivated was reported in Polonnaruwa District, (61,559 hectares) which is 16% of the total extent of paddy cultivation in the country. Paddy production in Polonnaruwa District was accounted for 18% of paddy production of the country and the highest production of 268,472 metric tons of paddy was estimated from Polonnaruwa District.

Other than above the city is processing more than 55% of the total paddy production of country. The historical irrigation network which has enormous bond with paddy cultivation also plays a vital role in district economy and improved the identity of the city.

Except from paddy, irrigation works and heritage city, The Flood Plains National Park is one of prominent land use of the area situated along the Mahaweli flood plain. The park was created on 7 August 1984 and considered a rich feeding ground for elephants and it safeguard the elephants migrate between Wasgamuwa and Somawathiya national parks.

2.2.3 Ongoing Development Programme

Currently the Polonnaruwa is undergoing a major development programme known as the "Pibidemu Polonnaruwa" under Urban Development Authority according to a concept of President Maitripala Sirisena. It envisions the development of all sectors in Polonnaruwa including roads, electricity, agriculture, education, health and environment will be developed comprehensively.

2.2.4 As Commercial/Administrative and service Capital of District

The declared urban area is functioning as the main administrative capital to the district and commercial capital for encircled sub urban areas beyond the district boundary with a threshold population around 600000. (Annex 05. city catchment). All the district level administrative offices, educational and health institutes are located within this urban area (Annexure 06:). The role as a higher order commercial centre it's fulfilling primary (consumer goods & services) and secondary level commercial facilities (Agri based services, chemicals, automotive, construction industry, electric/ power).

2.2.5 Demographic Information

The existing residential population of planning area is 65329 (2016) and will reach to 76905 in year 2030 with annual growth. Total population of the district in 2012 is 419000. Population growth rate is 1.16 which is beyond national level (Annexure 07:). According to the natural growth the district population will reach 516,200 in 2030 which will consider as main threshold of the planning area.

Kaduruwela South, Parakum Pedesa, Kuruppu handiya, Udawela, Nissankamalla pedesa, Ganangolla shows the higher population density as more than 1600 per SqKm. When comparing 2001 and 2012 statistics it can be seen that the population density increasing along A11 road from Kaduruwela to Polonnaruwa junction and up to new town area. The lowest population density recorded in Kotaleeya and Aluthwewa West as less than 200 peoples for SqKm. Sinhalese are the majority of population as 76% from total. 22% of Islam and 1% of, Tamil and 1% of Christian and other ethnicities are there.

2.2.6 Housing

There are 16684 households. From total population 93% is having their own houses. from that 92% of the houses are permanent and 7% are semi-permanent and only 1 % is temporary. Out of total 12% of houses are multi storied houses. Currently city shows the 497-housing deficit and it's a 3% from total families. the highest Housing density recorded in Mahaweli Pedesa and Kaduruwela south.

2.2.7 Economy of the City

When considering economically active labour pool (population above 15 years old) it is 46% from total which is below than national average (52%). The income level of 76% families are below 25000 LKR per month. But for many years Polonnaruwa district beyond national level poverty index as well. (Annexure 11,12,13). When dividing employment sectors in agriculture, industries and services percentage goes as 40%, 20% and 40% respectively. (Annexure 14) Comparing national level, the situation is equal to Mathale, Mathara and Mulathiv Districts. The situation shows the need of more economic opportunities for the city dwellers.

2.2.8 Water Supply

At present, 83% of the people are getting Pipe born water from National Water Supply & Drainage Board and 17% of the people receiving water from ground water wells. Mahaweli River and Parakrama Samudraya are the main two water source used by water board. Although the supplied water is in standard level Currently there is a trend with people to use filtered water for drinking purpose due to the threat in Kidney diseases. one litter of water cost 2 LKR.

When study in Fire safety Whole area is equipped with 6 fire hydrants (3 in Kaduruwela, 1 in hospital junction 1 in Pola junction and in new town.)

2.2.9 Electricity and Telecommunication

Considering electricity supply, according to the Ceylon Electricity Board report, people who are in Polonnaruwa urban area had enough connection by means 99% of the area gained electricity from the CEB. In telecommunication aspect Telecom (SLT) has been providing their service to entire town and CDMA, ADSL are available. The privet sector 8 telecommunication towers are located within the urban area and 4G coverage is available.

2.2.10 Health

In social infrastructure aspect, health and education sector take a prominent pace as the capital city of the district. The District general hospital located within urban area and equipped with 885 beds and 210 doctors with 22 wards and 46 units altogether. In addition to basic specialties including Anaesthesiology it provides specialized care in Orthopaedics, Eye, ENT, Cardiology, Dermatology, Rheumatology, Nephrology and Mental Health and also specialized services namely Radiology, Haematology, Microbiology and Histopathology. Preliminary Care unit caters to medical casualties. According to 2012 statistics 80,222 admissions with 292,063 OPD Attendance and 223,849 Clinic Attendance recorded which shows the half of district population taken the benefits.

There is ongoing national level hospital with kidney transplant facilities at urban area (at 28-mile post of A11 road) to treat the patients with the mysterious kidney disease that is striking mainly rice farmers in Sri Lanka's north central region. The project is a donation from China and kidney hospital will consist of 200 beds, 100 blood infiltration machines and modern surgery complex. This hospital which will be built at a cost of Rs. 12 billion.

Other than national hospitals there are 4 government and 13 private Ayurveda dispensaries in the area and 1 private hospital and 3 channelling centres are available.

2.2.11 Education

Polonnaruwa urban area belongs to Polonnaruwa educational zone and Thamankaduwa division. Total 30 schools spread within urban area. The royal central college is the only national level school in the area and it equipped with all facilities. For higher education purpose Pulathisi Adyapana Vidyapitaya, the technical college, the Open University, Bendiwewa and National Apprentice and Industrial Training Authority (NAITA), National Vocational Training Centre is available within the area. Those institutes are admitting 200,500,470,100 students per year respectively.

2.2.12 Land Use of the City

The land extend of Urban area is 103 Sq. km. And 62% from total land belongs to environmentally sensitive lands with paddy (31 %), forest, archaeological sites, tanks, marsh and water bodies. Out of total 23% is residential lands and those are mainly concentrated along main roads. (Annexure 11).

The city developed as main three nodes as Kaduruwela, New town and Heritage city at Polonnaruwa pola junction. These three nodes had natural separation with paddy cultivation and low lands before 2005. The administrative centre at new town showed very low development intensity in past few decades. But after 2015 With new infrastructure development projects rapid changes in land use taken place in all three nodes. If the situation continued the nodes will be meagre and there is a possibility of declining the uniqueness of heritage city.

2.3 Delineation of the Planning Boundary

The delineation of the planning boundary is based on the following three aspects. After overlie all three areas and aspects finalized the planning boundary for development plan 2030 with the consideration of the futuristic perspectives as well.

2.3.1 The functional region

As above explained Polonnaruwa urban area concentrated in to main three nodes such as Commercial City Kaduruwela, Administrative City of New Town and heritage city at Polonnaruwa junction. There are emerging sub centres at hospital junction, Gallella, Bendiwewa and Sewagama. Have done several studies in Oder to identify the functional boundary of the city. Such as Connectivity & settlement pattern, Integration of the area and the Network Centrality Assessment and Development pressure analysis and surveys. It could identify that there's a necessity to expand the boundaries of the existing gazetted Urban Area.

The Development Pressure has extended into adjacent 12 GN divisions which are out of the declared urban area in 2005. In some GN divisions only 1/3 of total land had the high development pressure.

2.3.2 The geographic characteristic

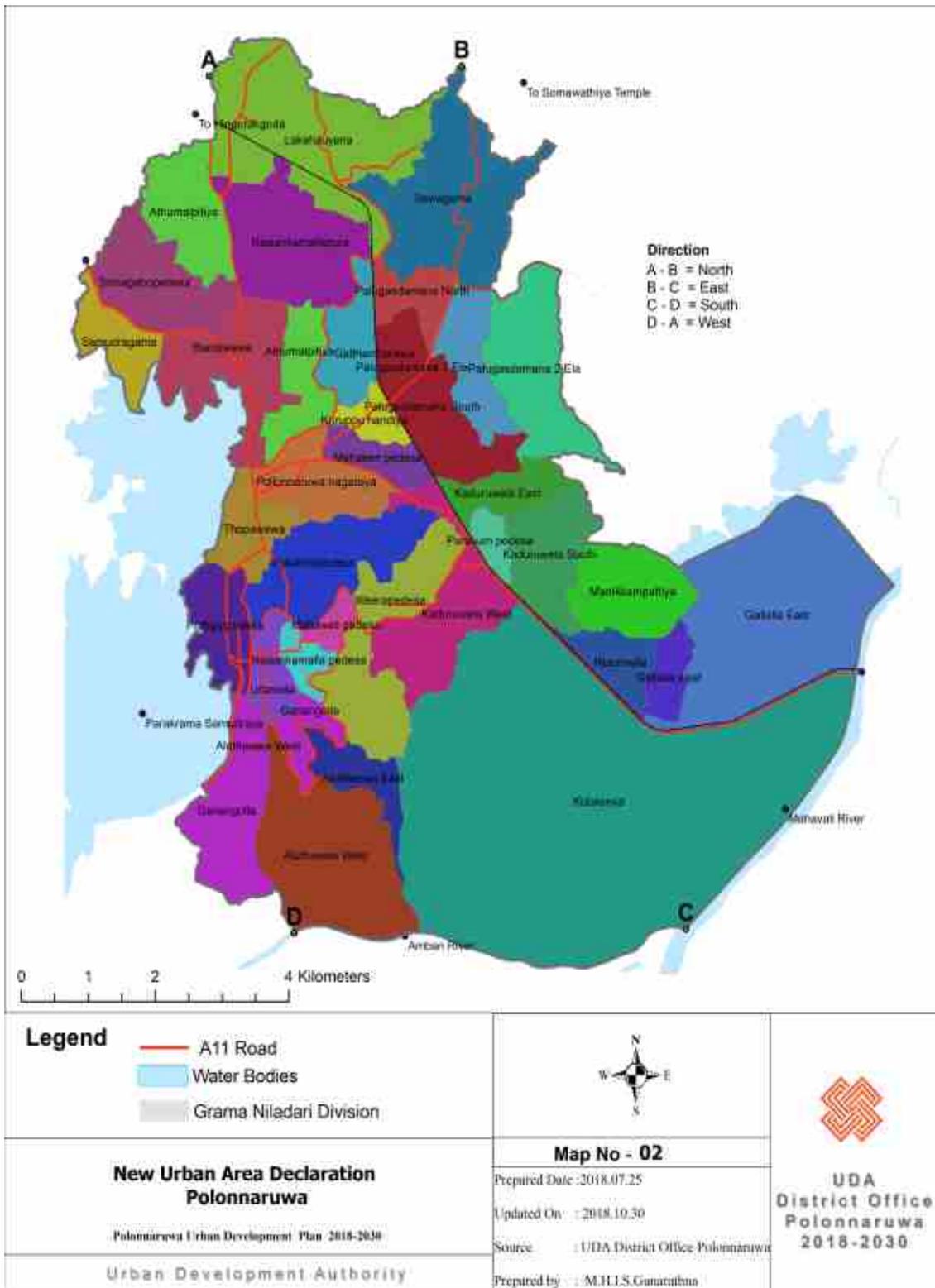
The identifiable clustering of built up areas (human settlements) and their separation with natural boundaries, vegetation patterns and hydro catchment areas counted while finalizing the planning area. The Mahawali River and national flood plain reserves from east and Amban River at south and Parakkrama Samudraya at west direction separate the settlements and their functions. The boundaries were finalized with those geographical characters in above said directions.

2.3.3 The administrative divisions

Early gazettes 22 GN divisions were belongs to the one local authority named 'Thamankaduwa Pradeshiya Sabha'. With the changes of local authority boundaries in 2016 Total 55 GN divisions divided in to two local authorities' namely "Polonnaruwa Municipal Council" (18 GN divisions) and "Polonnaruwa Pradeshiya Sabha" (remaining 37 GN divisions) by the Ministry of Local Government. While finalizing the planning area to avoid complicated situation in Administrative functions, whole Grama Niladhari division selected to be declared although functional area is 1/3 of total GN.

The finalized planning area boundary consisting 34 GN divisions (18 MC and 16 in PS) with total population of 65329 (2016) and 16684 families. The total land extent is 103 Sqkm.

New Urban Area Declaration Polonnaruwa 2018



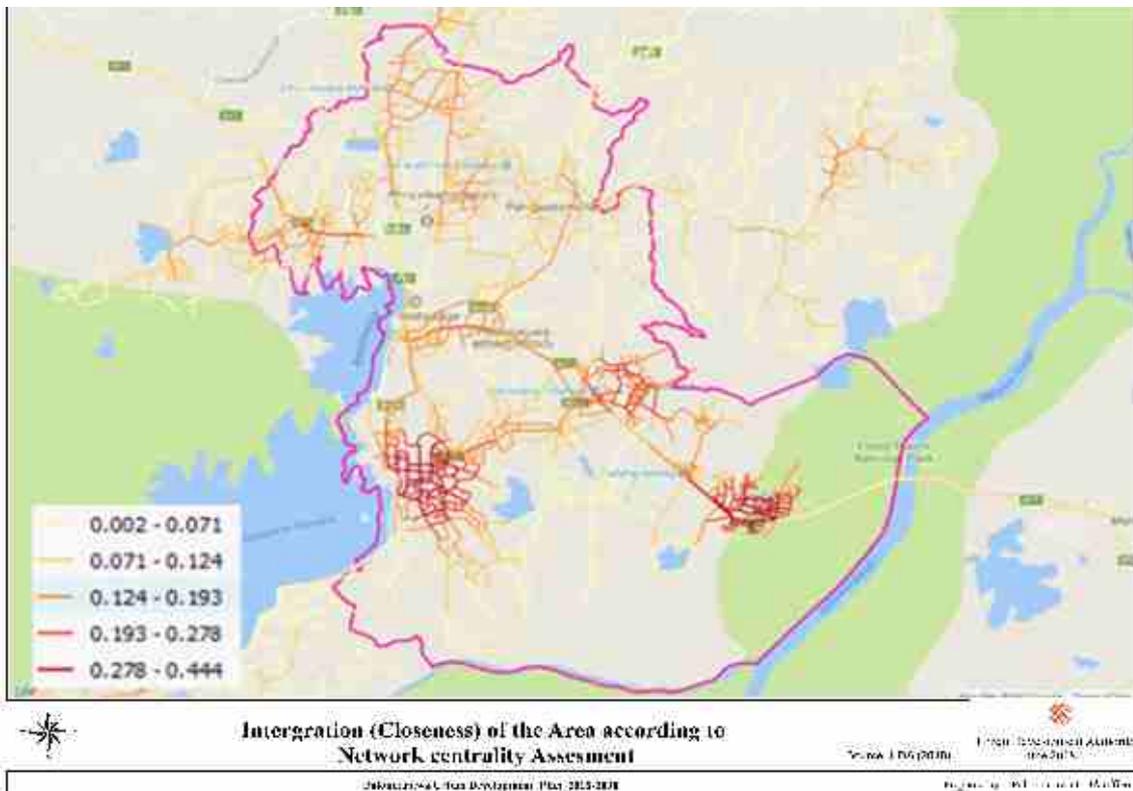
Map 2.3: Planning Boundary Demarcation with GNs

Source : UDA Polonnaruwa District office

Connectivity and Settlement Pattern in Districts

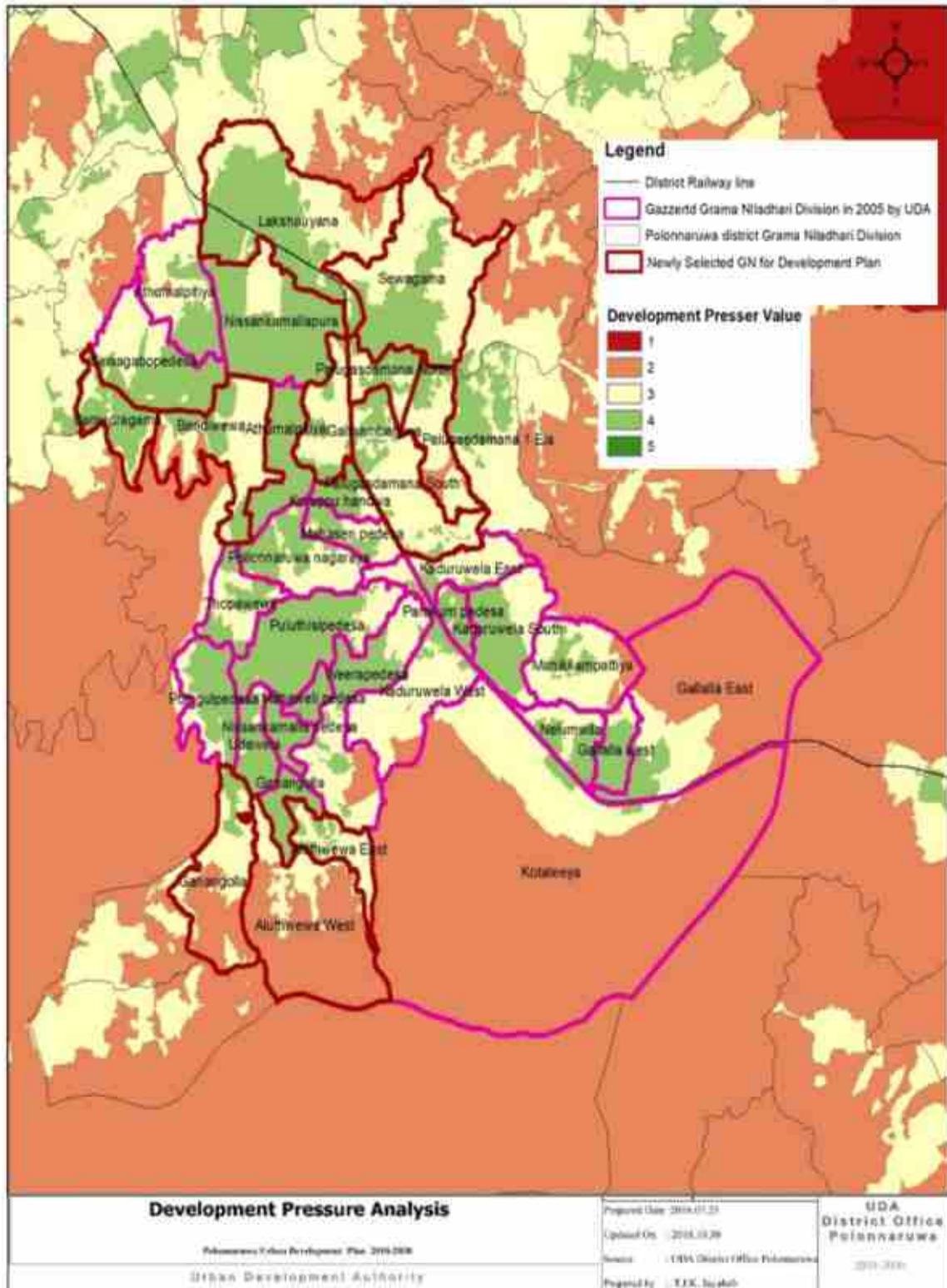


Map 2.4: Connectivity and settlement pattern of Polonnaruwa district
 Source: Esri HERE Delorme, USGS,inter map,imagery from digital globe 2018

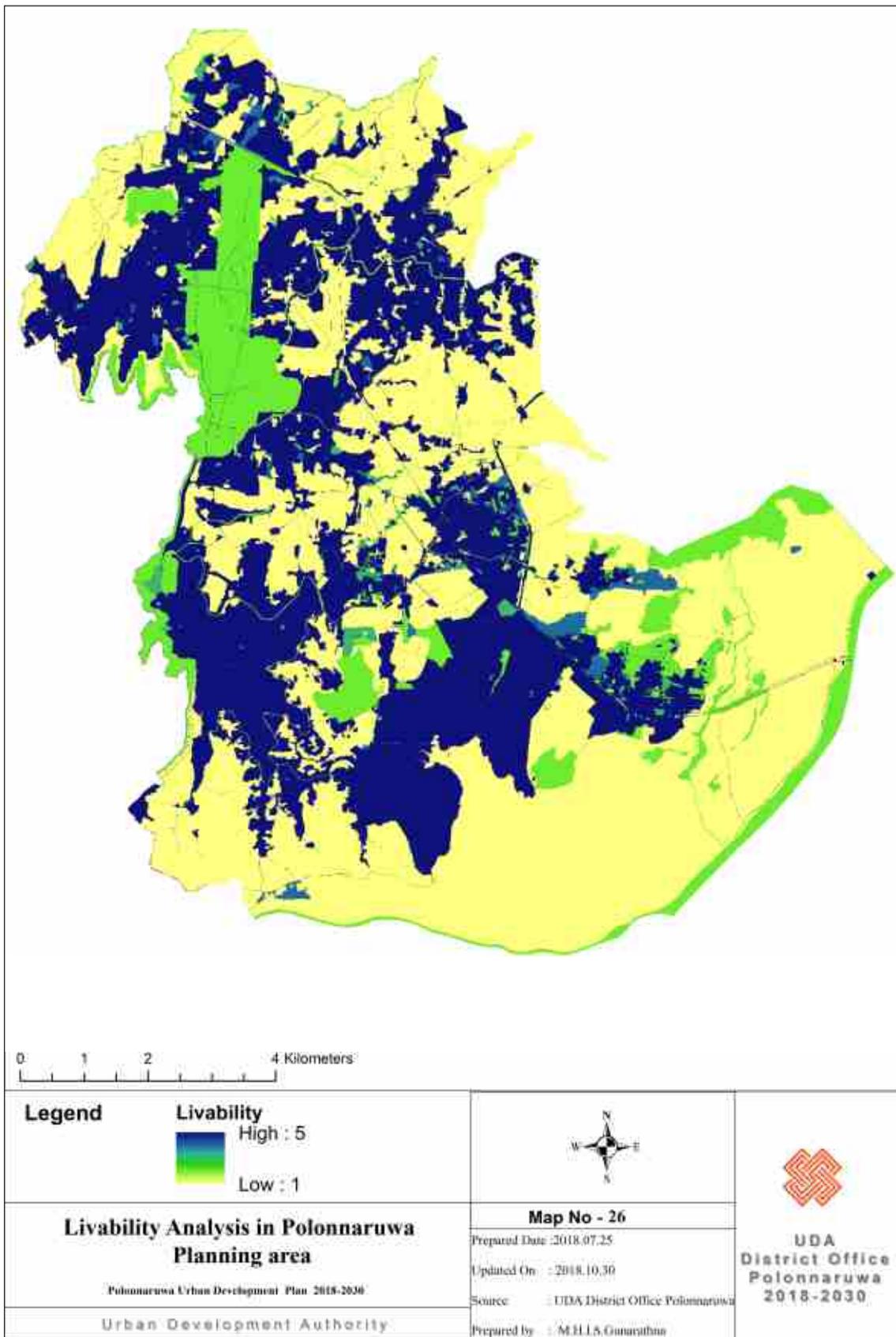


Map 2.5: Integration (closeness) of the area according to network centrality assessment
 Source : UDA Polonnaruwa District office

Development Pressure Analysis

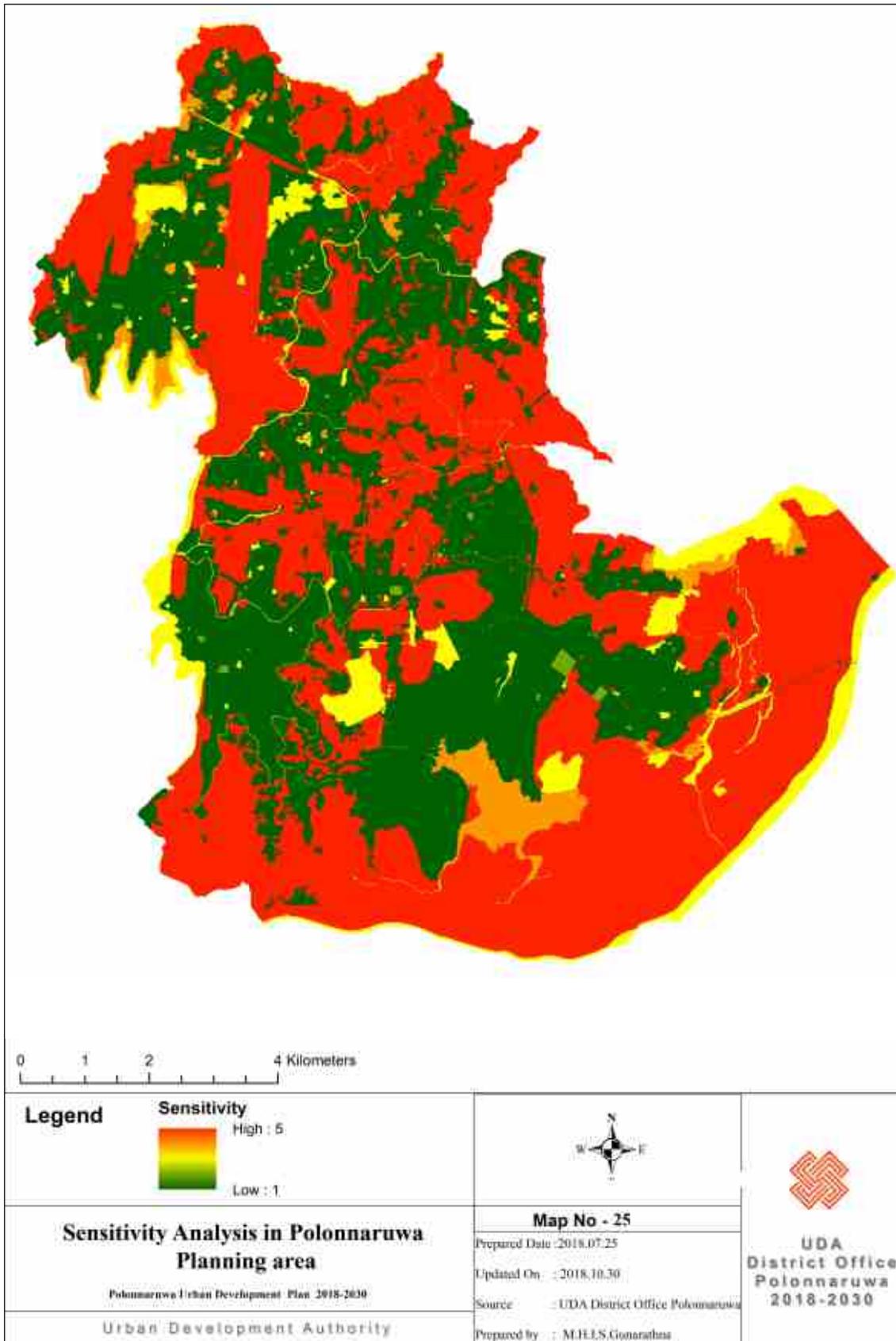


Map 2.6: Development Pressure Analysis
 Source : UDA Polonnaruwa District office



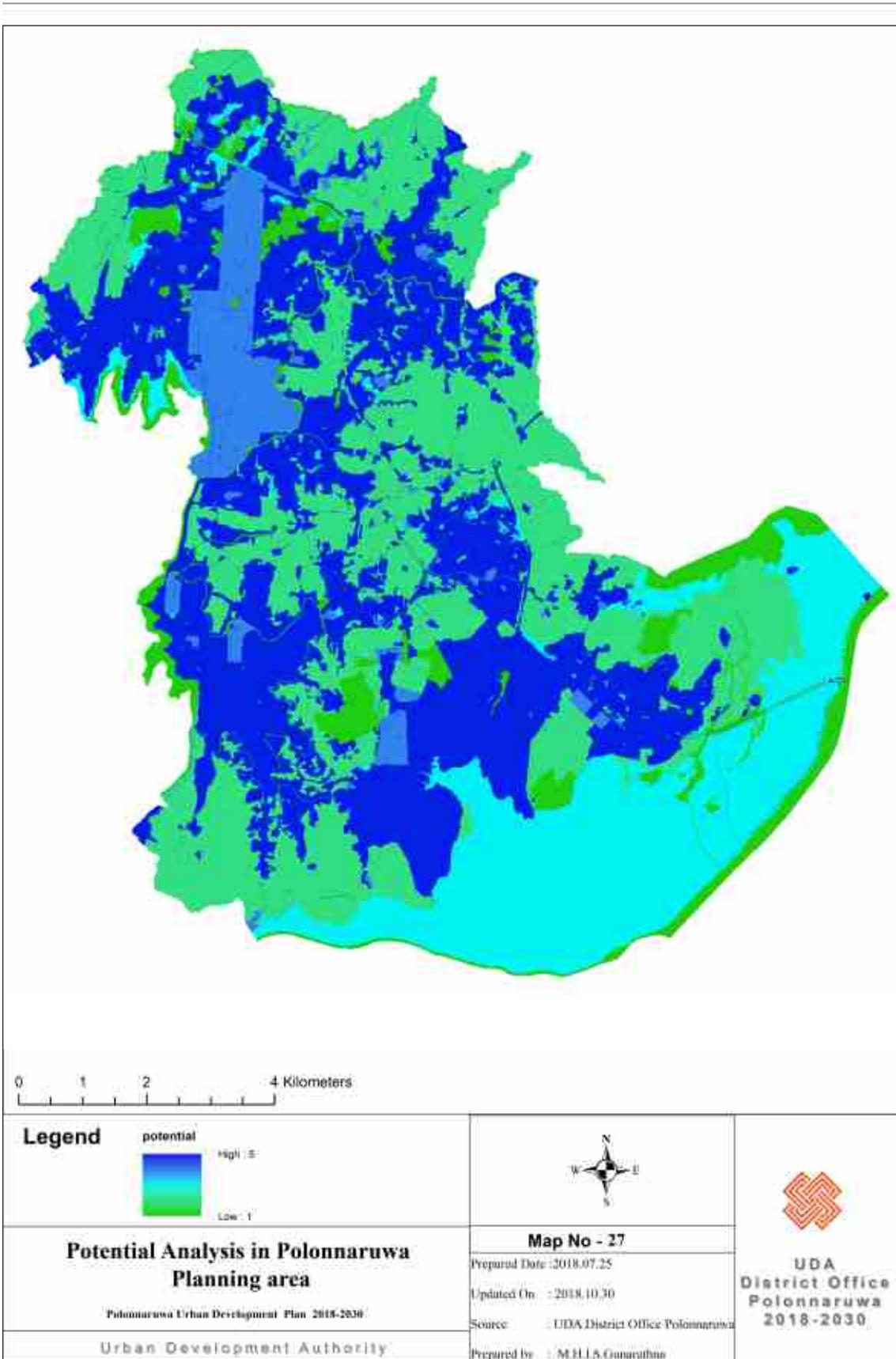
Map 2.7: Livability Analysis in Polonnaruwa Planning area

Source : UDA Polonnaruwa District office



Map 2.8: Sensitivity Analysis in Polonnaruwa Planning area

Source : UDA Polonnaruwa District office



Map 2.9: Potential Analysis in Polonnaruwa Planning area
 Source : UDA Polonnaruwa District office

CHAPTER 3: NEED OF THE DEVELOPMENT PLAN



3. NEED OF THE DEVELOPMENT PLAN

Preparation of a development plan in a gazetted urban area is a legal requirement under section 8 of the Urban Development Authority (amendment) Act, No.4 of 1982. And that plan must adjust the role of city in the National planning context (2030-2050) as well. The purpose of preparation of such a plan is to provide better living environment for the people of the city. The better living environment is achievable through facilitating the growth of the economy, protecting the natural and built heritage and improving the quality of life of all inhabitants.

Usually unplanned development leads to several issues in environmental and other sectors and creating dilapidated settlement gradually. And sometimes planned development leads to undesired outcomes due to lack of understanding in special requirements of city's inhabitants with existing social, economic, physical and environmental situations. To avoid above said circumstance UDA have followed scientific way to find the real requirements of a development plan for the Polonnaruwa urban area.

Polonnaruwa urban area has a land area of 103 Sqkm with total residential population of 64299 (2017 Resource profile). After analysing primary and secondary information with stakeholder consultations in each sector got a list of problems and issued to be addressed in 2030 plan. After analysing the problems, potentials and stakeholders' views it could finalize the need of development plan for Polonnaruwa. In order to achieve sustainable and liveable targets of the city this development plan has to address in mainly four fronts.

First, **area needs more trade and economic Opportunity.** According to statistics economically active only 46% (national average 52%) from the labour pool of the area (above 15 years). At the same time 76% of families are below the average income of 25000.00RS per month (Annexure 11 to annexure 16). The untapped potentials in tourism can use to increase the household income of the area. There is a world trend for agritourism and heritage tourism with cultural experience. With appropriate strategy and maximum use of available physical infrastructure facilities can harness the potential of tourism without harming the environment

Second, the city needs to **improve the Identity.** The Polonnaruwa city itself has a two type of identity. One is as a declared World Heritage city with historical evidences starting Anuradhapura Kingdom and even before arrival of Aryans. The other one is Paddy

industry; irrigation works and related Culture built up over the 100 centuries. The country named as “Granary of the East” in King Parakramabahu's time and still processing more than 55% of Paddy production in national production. The both type of identities are not reflecting in city's physical structures and it's wasting away a huge potential to the inclusive development of the city with existing tourism base.

Polonnaruwa still not taken the advantage of being the main city centre by passed in A11 road to connect with eastern region of the country. Recreation targeted tourist who pass the city for beach sides in east and even locals can be stopped with a strategic plan.

Third, **Protection & Conservation** of Historic elements and environmentally sensitive areas to ensure sustainable and uniqueness of the city. The Polonnaruwa became a world heritage city in 1985 due to main three criterions. Unusual dimensions of King Parakramabahu's city and because of very special relationship of its buildings with the natural setting is the first one. Polonnaruwa attest in an exceptional manner to several civilizations like Cholas, disciples of Brahmanism, and that of the Sinhalese sovereigns during the 12th and 13th centuries are the second. The area is a shrine of Buddhism and of Sinhalese history is the third one. The damages in to any of above will threaten to city as a world heritage and there are possibilities of de-listed the city from world heritage list. This will affect not only the city but also Whole Country which benefit from tourism sector.

With increasing demand for lands at main three centres of the urban area and many ongoing development projects treating the uniqueness of city and natural environment gradually. In order to protect Livability and sustainability, of the city protection of eco sensitive areas and conservation is very important.

Forth, **improve Beautification, Connectivity and Livability**. The tropical climatic situations such as high temperature and sudden high rains reduce the comfort level of the city. The Kaduruwela commercial city centre is the worst place and walking is not possible in afternoon at all. It increases the uneasy traffic as well. There are no organized open and recreational spaces in the city centre for relax and finding a green shade in Day time is a challenge.

One of a major problem mentioned by people is higher traffic in hospital junction and commercial city. It is resulted by many reasons such as lack of awareness about alternative

roads, no proper public transportation circulation in three nodes and improper parking, no turning circles, less walker friendly environment etc. Due to Non-availability of well-planned drainage and waste water treatment method in town centre resulted in polluting whole irrigation channel system. Untreated waste water with hard waste blocking channels and with sudden heavy rains and flat terrain is increasing the intensity of the problem (Annexure 4). 3/5 houses are facing problems due to drainages. The better connectivity in drainage, irrigation system and transport will improve the liveability of the city.

An integrated and comprehensive physical development plan is the only solution to overcome above said main issues and Polonnaruwa to be a healthy wealthy and adorable Heritage city.

Minister' s approval

Gazette Notification

CHAPTER 4: THE PLANNING FRAMEWORK



4. THE PLANNING FRAMEWORK

4.1 The Vision

The vision 2030 for Polonnaruwa urban area will be

“Green Glorious Heritage city in Kingdom of Rice”

Green explains Pleasant and Calm Green Environment in tropical climate & practice of eco city standers in future.

Glorious will refers to proud full, wealthy & Healthy city.

Heritage means to the Grate History and Protection of it while promoting tourisms.

City stands for the Polonnaruwa urban area.

In Kingdom of Rice is the uniqueness and Economy of City & District over the centuries.

4.2 Vision Statement

“Provide Comfortable living in tropical climate While achieving best advantages of been a heritage city and premier paddy producer of the country without losing uniqueness and nature of the city.”

4.3 The Goals

- 1. Polonnaruwa as the Best Heritage Tourism Destination in Sri Lanka by 2030 (Ruins, paddy, Irrigation based Agri tourism).**
- 2. Protection of Historic and Environmental sensitive areas.**
- 3. To make a pleasant & comfortable living in the tropical environment for residents & the commuters.**

4.4 Objectives

Goals	Objectives
<p>1. Polonnaruwa as the Best Heritage Tourism Destination in Sri Lanka (Ruins & paddy related Agri tourism)</p>	<ol style="list-style-type: none"> 1. Rearrange each element to be identical as heritage Ruins or paddy culture along all roads from Hathamuna junction to Kaduruwela entrance by 2025. 1. Arrange more than one alternative tourist routes to cover ruins and paddy culture both by 2025. 2. Preparation of stakeholder inventory for tourism related activities and provide online access by 2020. 3. Regularize all tourism related accommodation centers with tourist board by 2025. 4. Construction of a Paddy museum and specialized paddy sales center by 2025. 5. Practice Traditional Agriculture methods in selected paddy land at city center before 2030. 6. Establish more than one industry for Value added paddy production by 2030.
<p>2. Protection of Historic and Environmental sensitive areas.</p>	<ol style="list-style-type: none"> 1. Survey and physically boundary demarcation of lakes, and all heritage reservations 100% in planning area by 2025.
<p>3. To make a pleasant & comfortable living in the tropical environment for residents & the commuters.</p>	<ol style="list-style-type: none"> 1. To create a network of parks and green spaces linked with irrigation and Paddy network in Main three nodes by 2030. 2. To Provide one Organized open space or green shade within 500m walking distance by 2025 3. To Reduce the real feel temperature to actual temperature at the Kaduruwela city center by 2030. 4. To Improve the connectivity of irrigation canals 100% by 2030.

	<ol style="list-style-type: none">5. To Preparation and Implementation of a Drainage master plan for the Planning Area by 2030.6. To preparation of Waste water treatment plan and implementation of plan by 2025.7. To Increase the greenery of each plot more than 40% by 2025 and enhanced green experience of the city 2030.8. To assure 'Green Developments' in Polonnaruwa urban area with energy conscious, conserving and environment friendly designs and practices.
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CHAPTER 5: 'SWOT' & DETAIL ANALYSIS



5. 'SWOT' AND DETAIL ANALYSIS

5.1 SWOT for Goal (1)

Polonnaruwa as the Best Heritage Tourism Destination in Sri Lanka by 2030
(Ruins & paddy related Agri tourism)

Strength	<ol style="list-style-type: none"> 1. Declared as a UNESCO world Heritage city, 2. Surrounded by other UNESCO world Heritage cities, 3. 'Wewa' & Cascade systems of Sri Lanka among Globally Important Agricultural Heritage Systems by UN in 19/04/2018 4. Ancient Ruins with a great history, 5. Pibidemu Polonnaruwa program (infrastructure network, tourism facility center, and 3D museum.), 6. Existing tourism base and hotels, 7. Existing paddy production and processing units (Rice Industry), 8. Identical environmental hotspot in closer proximity to city, 9. Existing road network.
Weakness	<ol style="list-style-type: none"> 1. Non-availability of tourism routes connecting with the sacred city, 2. Unorganized tourism information center 3. 80% of tourism related accommodation centers are unauthorized, 4. Traditional paddy cultivation methods are not practicing widely.
Opportunity	<ol style="list-style-type: none"> 1. Political willingness, 2. Arrival of tourists to Sri Lanka, 3. Sri Lanka tourism strategic plan 2017-2020 by ministry of Tourism development authority and Christian affairs 4. Local & International Demand for Rice 5. Agri tourism concept specialized for paddy culture, 6. Low probability of natural disasters.
Threats	<ol style="list-style-type: none"> 1. Decline of heritage tourists to Sri Lanka,

Table 5.1: SWOT for Goal (1)

Source : UDA, District Office Polonnaruwa

5.1.1 Goal 1: Strength

1. Declared as a UNESCO world Heritage city

World Heritage Site is a landmark or area which is selected by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as having cultural, historical, scientific or other form of significance, and is legally protected by international treaties. The sites are judged important to the collective interests of humanity.

It can be delisted due to armed conflict and war, natural disasters, pollution, poaching, or uncontrolled urbanization or human development.

Report on world Heritage List No: 201 UNESCO ICOMOS, Paris, Mai 1982 mentioned the Following Criteria for declaration of Polonnaruwa City.

- The immense capital created by the megalomaniac sovereign, Parakramabahu 1, In the 12th century, is one of history's most astonishing urban creations, both because of its unusual dimensions and because of very special relationship of its buildings with the natural setting.
- Polonnaruwa attest in an exceptional manner to several civilizations, notably that of the conquering Cholas, disciples of Brahmanism, and that of the Sinhalese sovereigns during the 12th and 13th centuries.
- It is a shrine of Buddhism and of Sinhalese history. It is sufficient to recall that the tooth of Buddha, remarkable relic placed in the Atadage under Vijayabahu, was considered as the talisman of the Sinhalese monarchy: its removal by Bhuvanakabahu ii confirmed the decline of Polonnaruwa.

The heritage tourism definition itself giving a strength to the goal one. United States defines heritage tourism as "traveling to experience the places, artefacts and activities that authentically represent the stories and people of the past", and "heritage tourism can include cultural, historic and natural resources". The overall purpose is to gain an appreciation of the past.

2. Surrounded by other UNESCO world Heritage cities

There are 8 UNESCO World Heritage Sites of Sri Lanka.

01. Ancient City of Polonnaruwa (1982)
02. Ancient City of Sigiriya (1982)

07. Central Highlands of Sri Lanka (2010)

08. Sinha raja Forest Reserve (1988)
Seruwila Mangala Raja Maha Viharaya

Ancient pilgrim route Seruwila to Sri Pada (Sacred Foot Print Shrine) along the Mahaweli river in Sri Lanka

From them Sigiriya, Dambulla, Anuradhapura are in surrounding and Kandy is in only 4hours away. The Seruwila Mangala Raja Maha Viharaya, and the Ancient pilgrim route Seruwila to Sri Pada (Sacred Foot Print Shrine) along the Mahaweli river had been submitted to the “Tentative List “of UNESCO which is in adjoining to the urban area. IN that sense Polonnaruwa town is the centre for these world heritage cities.

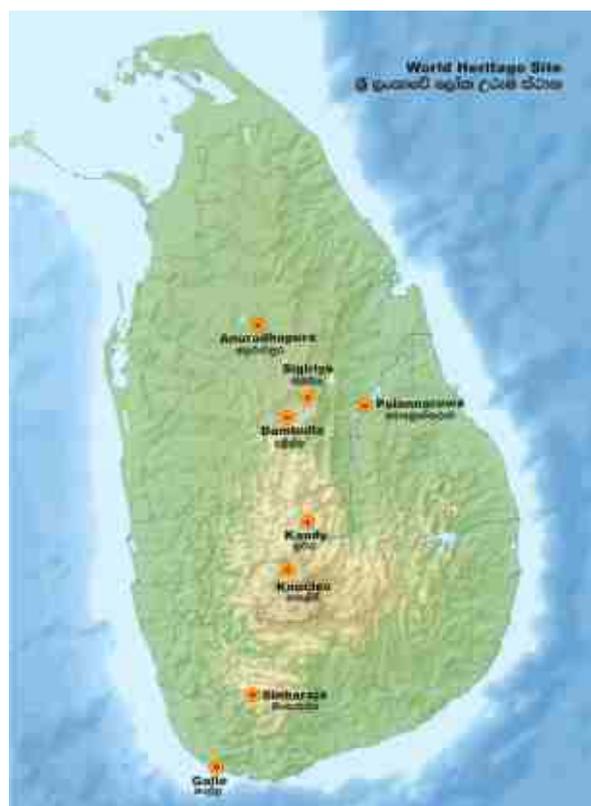


Figure 5.1: Heritage cites in Sri Lanka
Source : Archeological Department

3. ‘Wewa’ & Cascade systems of Sri Lanka among Globally Important Agricultural Heritage Systems by UN in 19/04/2018

A Sri Lankan agrarian system, the “ellanga gammana” or Cascaded Tank -Village system in the Dry Zone, was designated as a Globally Important Agricultural Heritage System (GIAHS) by the Food and Agriculture Organization of the United Nations (FAO). The Cascaded Tank -Village System in Sri Lanka was recognized at the International Forum and Award ceremony for new GIAHS sites in Rome, Italy.

This FAO-led initiative aims to protect and promote valuable agricultural heritage, preserve biodiversity and traditional knowledge, as well as create resilient ecosystems.

The foundation for the largest part of the country’s agricultural production, the village tanks host a remarkable heritage of agro-biodiversity and wild biodiversity and constitute a unique buffer against natural disasters and climate change. The global significance of this system is high due to the practical solution it provides

The foundation for the largest part of the country's agricultural production, the village tanks host a remarkable heritage of agro-biodiversity and wild biodiversity and constitute a unique buffer against natural disasters and climate change. The global significance of this system is high due to the practical solution it provides to absorb shocks of natural disasters such as floods which can be controlled by storing water, and drought by reducing the water loss from tanks due to existence of the surrounding ecosystem. The Cascaded Tank-Village System also contributes to efficient water management with water from one tank flowing to another, through a network of tanks and streams.



Figure 5.2: Components and their relative positions in the small tank system in Sri Lanka

Source: Dr.P.B. Darmasena 2010: *Cascade Irrigation Systems for Rural Sustainability*

However, the continuation of the Cascaded Tank-Village System is threatened by the poor income of farmers, rural-urban migration of the youth, deforestation, and the degradation of the tank eco-system. Its protection is integral to ensure the continuity and improvement of the country's food and livelihood security, as well as sustainable rural development. The Government of Sri Lanka has taken a policy decision to reinforce the Cascaded Tank-Village System and is preparing a Master Plan for the conservation and development of the system. (Source: <http://www.fao.org/srilanka/news/detail-events/en/c/1118377>)

There are three medium sized tanks and around 45 small scale lakes in planning area which functioning according to the Ellangawa concept. The Parakrama Samudraya is in western boundary and not belongs to the planning area but the main two outlets and irrigation network starting from the Samudraya tank bund.

The ancient technology of irrigation works can be shown in actual sites and will be use as huge potential for agritourism as well.

1. Ancient Ruins with a great history

All the evidence for a great history can be seen in the Polonnaruwa sacred city and in the museum. The technology in building construction, irrigation systems, cultural combination, environmental balance, economic character such as coins, health sector, education facilities and several other evidences are still available for experience. The UNESCO heritage declaration is a result of this and one of a great Strength that this city to become the best heritage tourism destination in 2030.

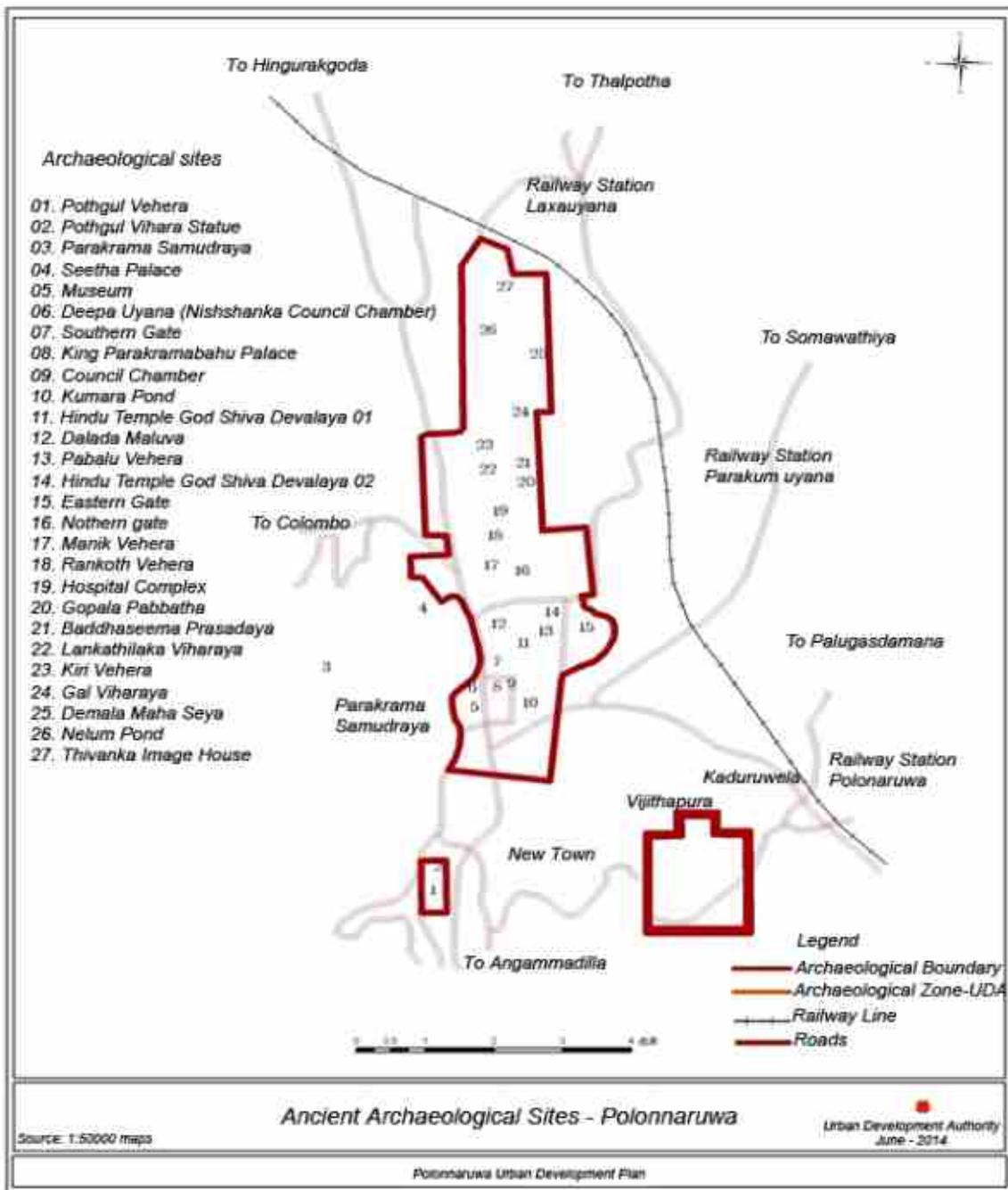


Figure 5.3: Map of ruins in Polonnaruwa sacred city

Source : Department of Archaeological

Polonnaruwa had been civilized and developed since BCE period, "Vijithapura", where "Dutugemunu, Elara" battle occurred may be present Polonnaruwa. The most ancient archaeological witness found in Polonnaruwa at present is in Gopala Pabbatha (Now spell as 'Gal Viharaya'). It belonged to the 1st century (CE). King Upatissa's (365-406CE) regime in Polonnaruwa period was the first to be mention in Historic Books (Wansha Katha). He constructed Thopa Wewa. Maha Panadipa Viharaya was in Polonnaruwa built by King Aggabothi III (629-639CE).

Since 7th century, foreign invasions and inner struggles occurred many times. This could be the reason, for transferring kingdom from Anuradhapura to Polonnaruwa as a temporary control centre. King Aggabodhi IV (667-683CE) also transferred the Capital into Polonnaruwa as a temporary control centre and died there. King Aggabodhi VI transferred his government into Polonnaruwa, latter part of his regime. King Mahinda II (777-797CE) built a Pirivena for Dama Viharaya and Thambilitota Pirivena. King Udaya (797-801 CE) built a hospital in Polonnaruwa.

In 1017 AD. Soli People defeated King Mihindu V, transferred regime to Polonnaruwa changed its name to "Jananathapura". Starting point of Polonnaruwa era indicates here according to chulawansa until king Vijayabahu the great freed the country; Soli people ruled the country destroying the culture as demons. During this period large numbers of buildings were built to satisfy Hindu ruling and religion, in Polonnaruwa. Present Shiva Devalas were constructed during that period.

Vijayabahu the great (1055-1110CE) freed the country; his coronation took place in the newly built palace in Anuradhapura, but he chose Polonnaruwa as a Capital of his kingdom. Since then more than fifteen powerful and power less kings and queens ruled the country, choosing "Polonnaruwa" as capital.

Number of buildings within the ancient Polonnaruwa city were constructed by Parakkramabahu the great (1153-1186CE). Among those the Raja Maligawa (Palace), Auditorium. (Administrative buildings), religious buildings mainly Alahana Pirivena; The great Parakrama Samudraya, Angammadilla (Irrigation Technology) get together and formed a completed city. King Parakrama the great claimed much honour for decorating and completing the City of Polonnaruwa. Irrigation technology reinforced during the period of Parakramabahu the great

and Country honoured as "Eastern Granary" through the prosperity of Paddy Cultivation at this era.



Figure 5.4: Royal Auditorium of King Parakramabahu

Source: <https://nerdnomads.com>



Figure 5.5: 7th story Palace of King Parakramabahu

Source: <https://nerdnomads.com>

The hospital built within "Alahana Pirivena", depicted the development in health sector of the city during that period. The theatre tools found in this hospital were in much advanced stage When compared with today. king Nishshankamalla (1187-1196CE) added new buildings to the city while restoring the collapsed ones. After Kalinga-Maga invasion, Polonnaruwa as a capital Collapsed forever.

Resemblance can be seen in Sri Lankan arts and South Indian arts, due to fifty (50) year chola regime. Hindu devalas in Polonnaruwa city were built with the help of South Indian architecture. Even after Chola ruling and during Sinhalese ruling the good relationship between two cultures, Sinhala and Hindu could be seen, it is clearly indicated through the present buildings. The sign of cow in the Moon Stone removed as it is considered as the holy one because it is the vehicle of God Shiva. South Indian architectural tradition of "Gedige" used in building Image houses.



Figure 5.6: The Polonnaruwa Moonstone

Source : <https://sandakada+pahana+polonnaruwa>



Figure 5.7 : Nishshanka Latha Mandapaya

Source: <https://nerdnomads.com>

Letters used in Polonnaruwa era were in much developed stage as well. Letter of "Polonnaruwa Kathikawatha" written by king Parakramabahu the great is available in Galviharaya. Galpotha Lipiya (letter instone) Puwaru Lipi (letter, written in board), Asana Lipi were written by king Nisshanka malla. Pana Kaduwa, Copper sannasa, Wellakkara Tamil inscription were belonged to King Vijayabahu the great. All those belonged to Polonnaruwa period.

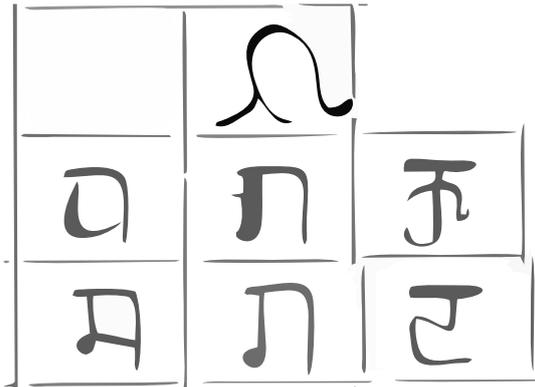


Figure 5.8: Letters in King Parakramabahu's era
Source: <https://nerdnomads.com>

Vijayabahu the great was the first Lankan King to put his name on a coin. Earlier kings issued anonymous gold coins. Gradually the quality of gold coins reduced, then silver coins, later on copper coins were issued. Since then centuries passed, without issue of local gold coins. Monarchs after King Vijayabahu followed his style and issued coins with their names on the coin.

Figure 5.9: Coins in King Parakramabahu time

Source: *Ancient Sri Lanka - Stamp Series / Polonnaruwa Era /2009.06.23 / Philatelic Bureau Department of Posts, Postal Headquarters*

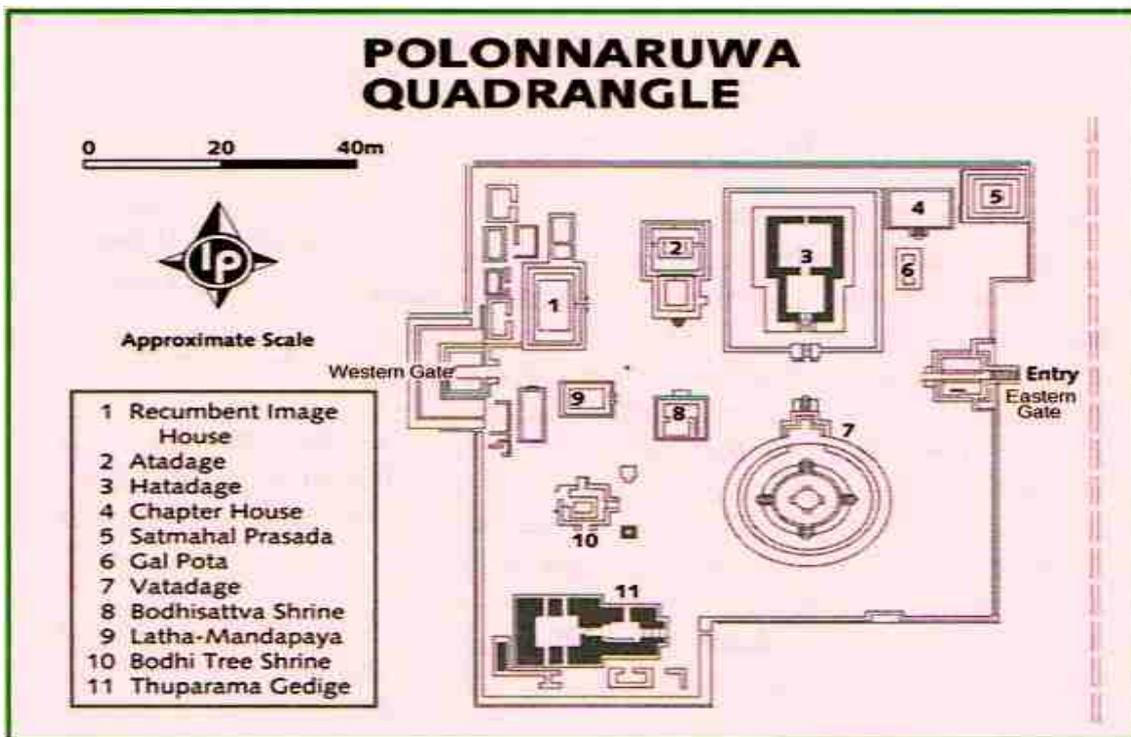


Figure 5.10: Polonnaruwa Quadrangle

Source: <https://nerdnomads.com>

5. Pibidemu Polonnaruwa programme (infrastructure network, tourism facility centre, and 3D museum.)

Existing Development Concept for urban area in Pibidemu Polonnaruwa development programme is to develop three nodes in order to protect identity in heritage city, facilitate commercial activities in Kaduruwela as a commercial city and new town as the administrative city. Many projects have identified and some projects are already completed to achieve that goal. From total Pibidemu Polonnaruwa Programme 11 projects are directly support to goal no.1. (Annexure 01)



Figure 5.11: Development concept for urban centre
 Source: Draft Development plan Polonnaruwa 2005-2015

05. Existing tourism base and hotels

According to the categorization of annual report of year 2016 by Tourist board, Polonnaruwa belongs to main three routes selected by travellers such as 'grand tour route', 'city in Buddhism' and 'beach route'. which shows a higher probability of a tourist to travel via the city at least once.

Simultaneously the Foreign tourist arrival to Polonnaruwa is higher than the locals. Approximately it's double than the locals. And it's beyond the tourist arrival for Anuradhapura as well. The peak time is February and August. (Annexure 23)

There area around five, star class hotels in the urban centre and more than 50 middle scale hotels and guest houses and more than 100 home stay places advertising in the tourist web sites. (Figure 5.13)

Month	Foreign	Local
January	17386	3531
February	23661	7773
March	17899	13570
April	9740	7417
May	6301	3667
June	5910	6060
July	16885	11004
August	24489	11061
September	11992	6689
October	9921	3609
November	12948	2158
December	17035	7877
Total	174167	84416

Table 5.2: Tourist arrival to Polonnaruwa
Source : SL Tourist Development Authority



Figure 5.13 : Some Hotels and facilities in Polonnaruwa

Source: <https://www.booking.com/hotel/lk/>



Figure 5.14: famous travelling routes of Sri Lanka - Foreign Tourists

Source: Annual Statistical Report 2017
Sri Lanka Tourism Development Authority

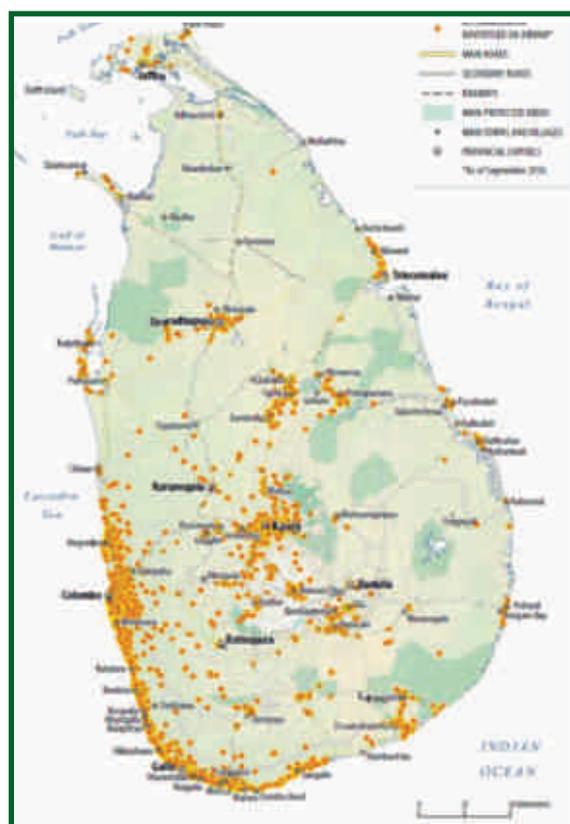


Figure 5.15: Accommodation Concentration around Sri Lanka

Source: Annual Statistical Report 2017
Sri Lanka Tourism Development Authority

6. Existing paddy production and processing units (Rice Industry)

The origin of Paddy cultivation in Sri Lanka goes to the history between 161 B.C. and 1017 A.D. Paddy is the most staple crop occupying 34% of total cultivated area in Sri Lanka. the total land devoted for paddy is estimated to be about 725,000 Hectares at present and average annual extent is about 870000 ha including two main reaping seasons Yala and Maha. Paddy crops are cultivated as a wetland crop in all the districts of Sri Lanka. From total paddy production of island Polonnaruwa district is producing 15%. And the Average yield per net hectare in Polonnaruwa is also higher than the national average.

Average yield per net hectare (Kg)			
	District	Sri Lanka	Production MTs
2015 Yala	5131	4527	280476
2014/20150 Maha	5306	4364	349625

Table 5.3: Average yield per hectare

Source: Annual Statistical Report 2017 Polonnaruwa

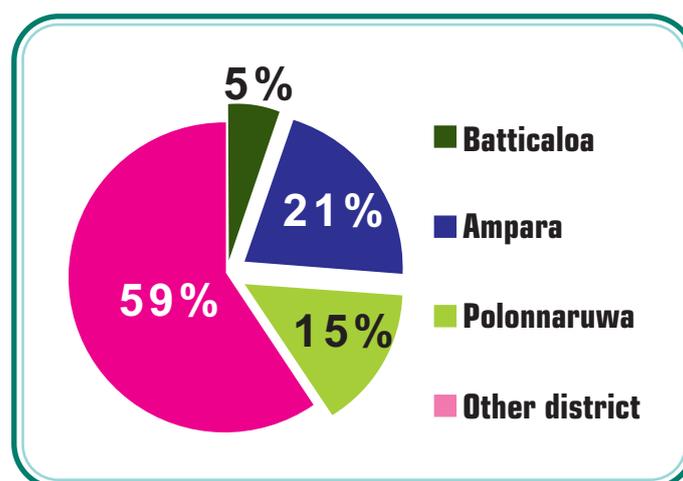


Figure 5.16: Paddy Production of Sri Lanka 2016 Maha Season

Source : District Statistical report 2015 - Polonnaruwa

	Gross Extend Down	%	Gross Extend Harvested (Acres)	Av, Yeild (Buzsals Per Net Acre)	Net Extend Harvested	Net Extend Harvested	%
Batticola	155273	12	91095	48.81	80400	3624	5%
Ampara	201285	15	167382	92.8	159967	14844	21%
Polonnaruwa	122615	9	118072	98.53	104446	10291	15%
Other 21 Districts	661510	64	569499 Av.		501993	41532	59%
Sri Lanka	1340683	100	946048	83.41	846806	70291	100%

Table 5.4 : Paddy Production of Sri Lanka 2016 Maha Season

Source : District Statistical report 2015 - Polonnaruwa

The Rice Factories of Polonnaruwa Processing more than 55% of the Paddy Production of Sri Lanka. There are 6 Large scale factories and 129 of Medium and small-scale factories in urban area. The government seed farm also located within planning area and occupying 200 acres of land. And three government paddy stores available with capacity of 12500Mt.

6. Identical environmental hotspot in closer proximity to city

There are 6 National Parks in surrounding to the planning boundary under wild Life Conservation Department. Minneriya, Kaudulla are famous for eliphanat watching. And Wasgamuwa, Somawathiya, Maduruoya, Gal oya National parks are also attract by tourist. The existing tourist arrival for above national parks showing the huge potential for tourist to stay at Polonnaruwa city.

Apart from the sacred city the urban area itself rich in bio diversity and enough beautiful places to visit. Parakrama Samudraya Tank reservation and Mahawali flood plain National park with more than 20 wild elephants, and paddy lands and other wet lands are habitats for many birds, butterflies and many other fauna and flora. The tourist can be benefited with ruins and nature too.

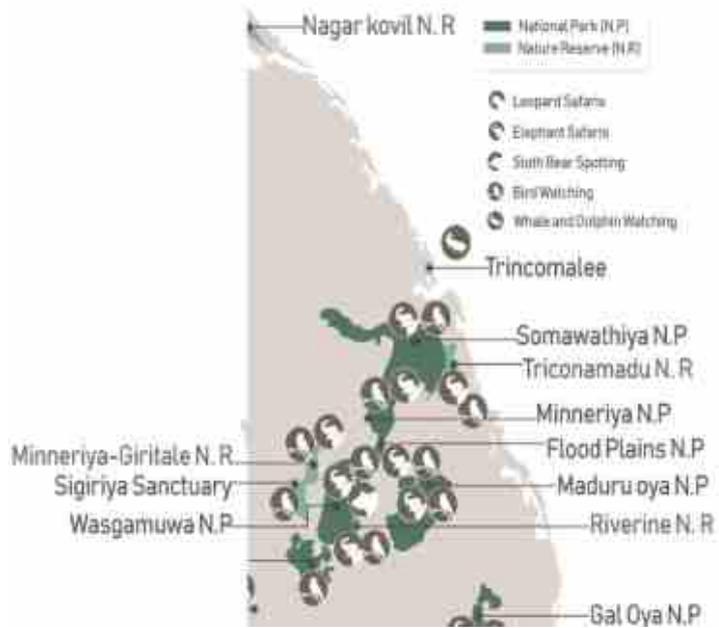


Figure 5.17: National Parks at Closer proximity
 Source: Department of wild life

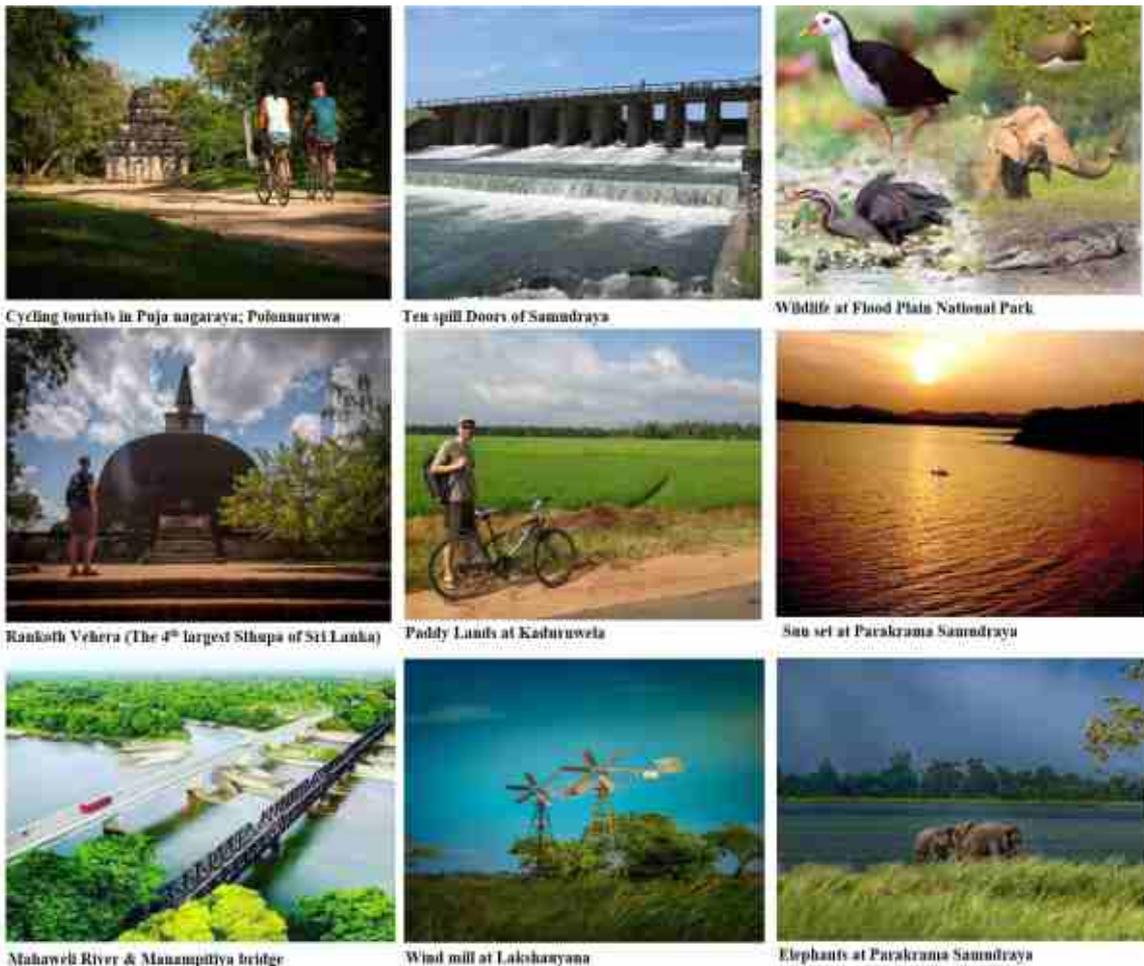


Figure 5.18: Beautiful locations within the urban area.
 Source: Random Collection From Internet

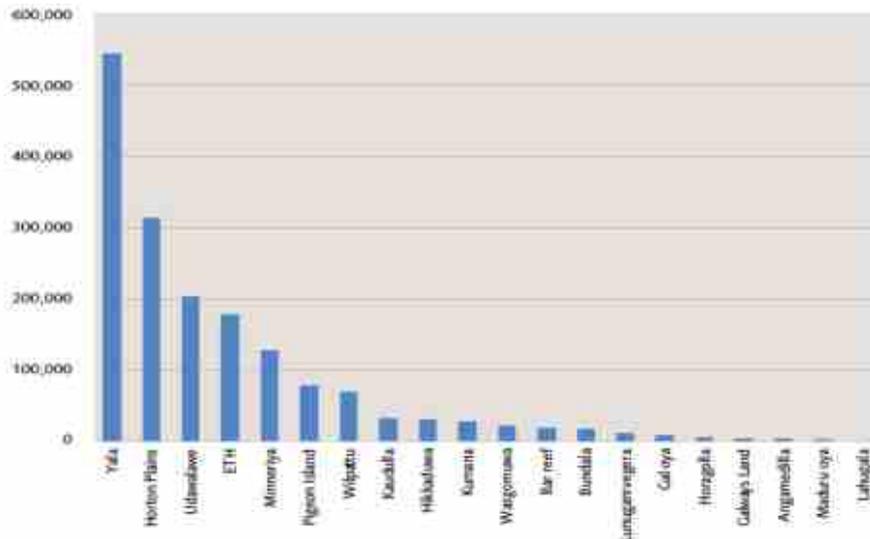


Figure 5.19: No. of visitors at National Parks in Sri Lanka
 Source: Annual Statistical Report 2017 Sri Lanka Tourism Development Authority

8. Existing road network

Higher The accessibility will grater the potentials for development And Polonnaruwa urban area is well connected with sub urban centres and the integration is very high in main nodes. (Map 2.5 : Intigration of the area)

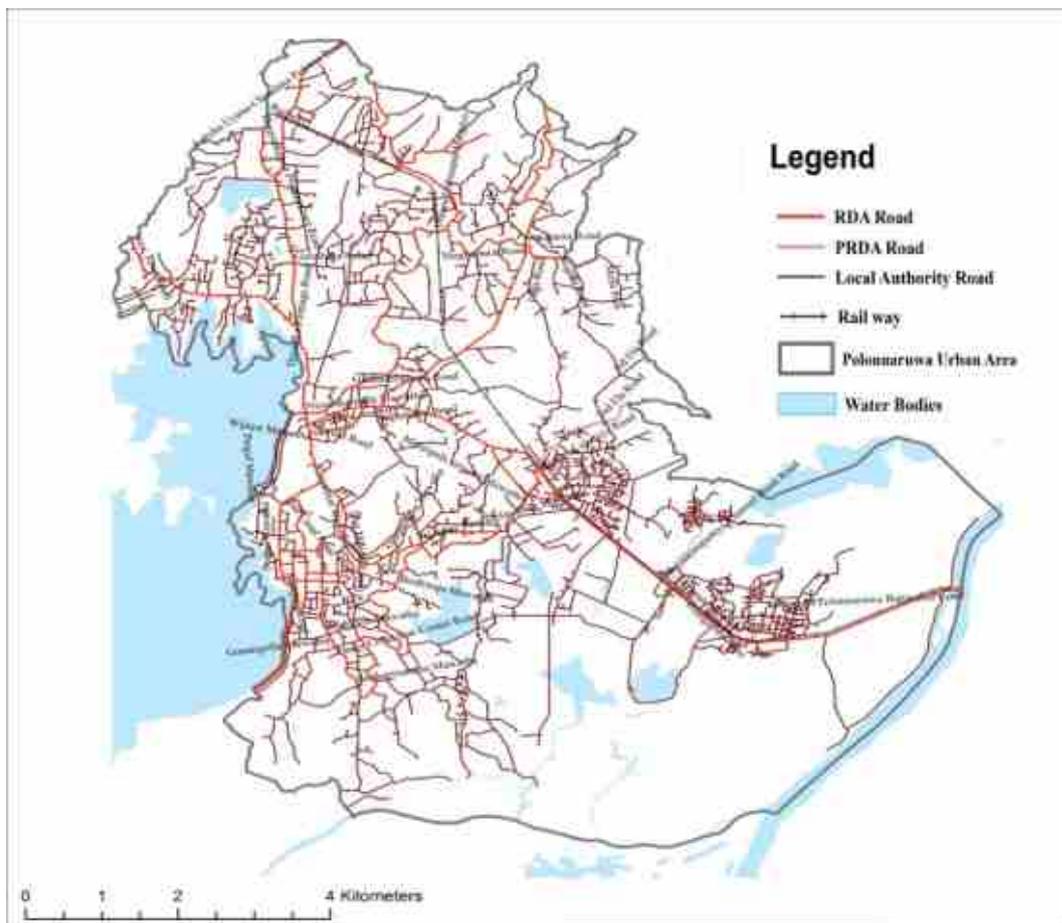


Figure 5.20: Road network of the planning area
 Source: UDA Polonnaruwa District Office

5.1.2 Goal 1: Weakness

1. Not availability of tourism routes than sacred city

There are no any organized travelling routes for the foreign tourist except for watching sacred city. With the interviews held with foreign tourist 90% are not known about the history related paddy culture of the area. Only 40% is having cycling experience to the outer area of sacred city. There are no any display boards of showing the available potentials for enjoy by them.

2. Unorganized tourism information centre

There was no any responsible place for tourist to have information regarding the city except central cultural fund and the museum. Those were covered information with the ruins and heritage city. To facilitate tourist with all other services Awakening Polonnaruwa development program constructed the Tourism information center in closer proximity to the heritage city. But the place is not well equipped by relevant organizations yet.

3. 80% of tourism related accommodation centres are not authorized by SLTDA

There are only 12 hotels and accommodation centres are registered in the tourist board from total planning area. There are more than 100 other places are advertising in the tourist web sites. These unregistered accommodation places and untrained staff will harm the future tourist arrival to the city.

4. Traditional paddy cultivation methods are not practicing widely

We have a more than 5000-year history in cultivating paddy lands. The traditional agricultural methods, equipment, seeds, non-chemical pest controlling methods were available. But none of the area is practicing those at the moment. to become a heritage tourism destination in paddy culture this point is considering as a weakness.

5.1.3 Goal 1: Opportunity

1. Political Willingness

The present president of the country Hiss Excellency Maithripala Sirisena is from the Polonnaruwa district. And his willingness is matching with the vision 2030. With the willingness it has a greater possibility of implementing many projects

2. Tourist arrival to Sri Lanka

In Sri Lanka, tourism is the third largest export earner in the economy, after remittances and textiles and garments. In the past five years, growth in number of visitors has been unprecedented, averaging more than 22% on year, of which 80% to 90% visitors coming to Sri Lanka on holiday. In 2015, 1.8 million international visitors came to Sri Lanka, stayed an average of 10.1 days, and generated an estimated US\$2.98 billion. In 2016, international visitor arrivals reached over 2 million and revenue generated was approximately US\$3.5 billion. (Figure 5.20)

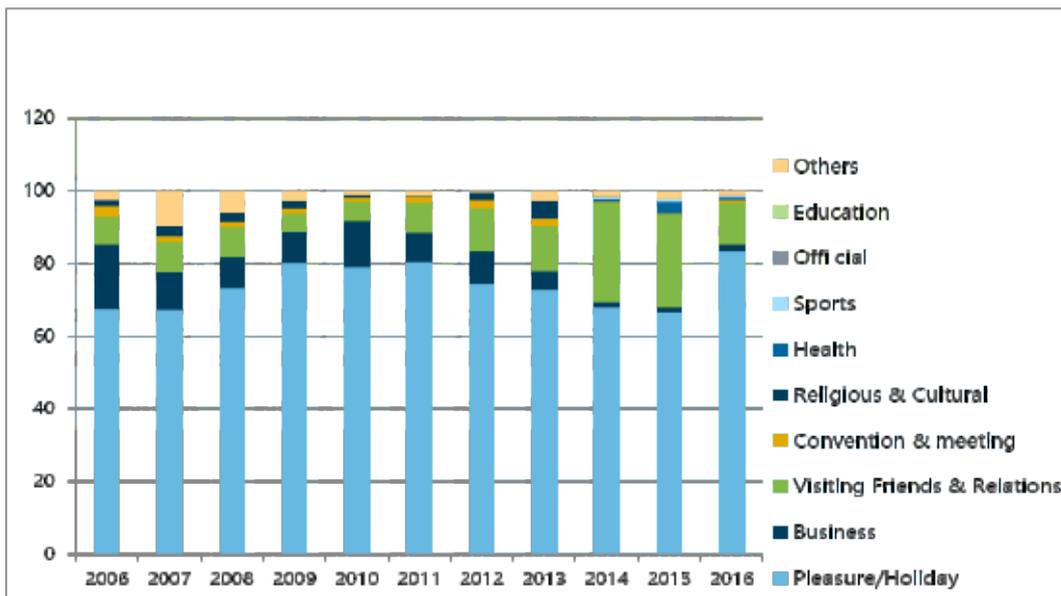


Figure 5.21: Distribution of tourist by purpose of visit 2006 - 2016

Source : Annual Statistical Report 2017 Sri Lanka Tourism Development Authority

FIGURE 12: Visitor numbers at Central Cultural Fund-managed sites of Sigiriya, Anuradhapura, Polonnaruwa and Galle

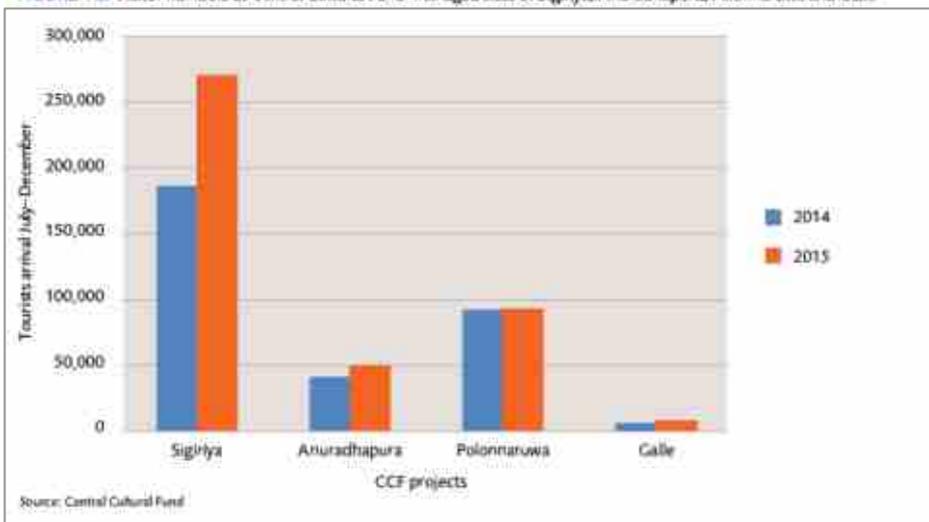


Figure 5.22: No of Visitors in main heritage sites

Source : Annual Statistical Report 2017 Sri Lanka Tourism Development Authority

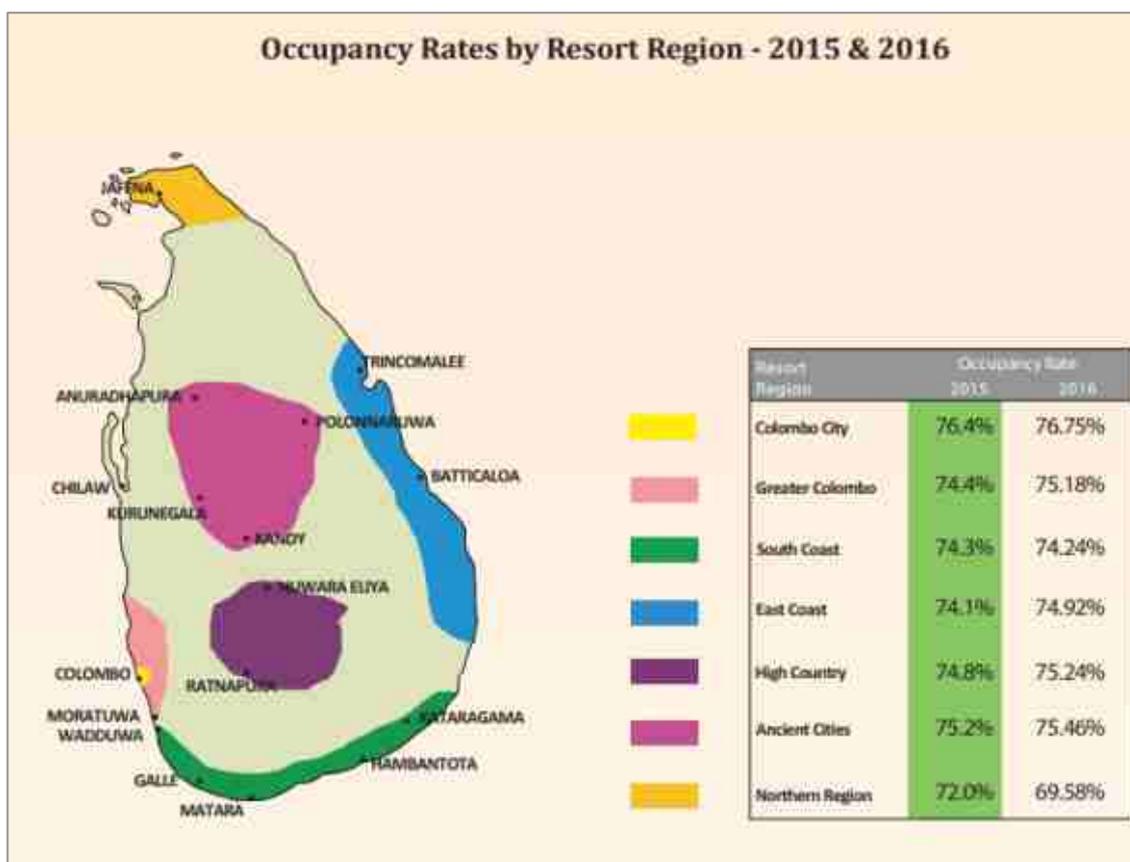


Figure 5.23 Occupancy rates by resort region 2015-2016

Source: Annual Statistical Report 2017 Sri Lanka Tourism Development Authority

3. Sri Lanka Tourism's strategic plan 2017-2020 by Ministry of Tourism's Development and Christian Affairs

The context and rationale for this Tourism strategic plan (Tsp), which recommends actions and implementation mechanisms for the next four years, with a long-term view toward Tourism Vision 2025 and achieving the United Nations (UN) sustainable development goals. The target is to transform the tourism industry to make Sri Lanka competitive in the global travel market place. Fundamentally, the ambitions of this TSP are to increase revenue for the country, support local communities, and increase tourism on a sustainable platform.

The plan will ensure that

- Visitors have more opportunities to spend on extraordinary experiences, with more value-added sites to visit and stay longer.
- Communities are active participants in delivering the memorable experiences.
- Investors have access to hassle-free opportunities and partnership prospects.
- A skilled, service-oriented workforce is better equipped to engage in higher-value tourism Services.

- Government is well coordinated and consistent, prioritizing sustainability and using reliable data to make decisions.

The whole plan is a big opportunity with goal 1 to achieve. By 2025, it is hoped that Sri Lanka will be identified as a place for memorable, authentic and diverse tourism experiences. And if this strategic plan succeeds for whole country the Polonnaruwa has a huge opportunity in achieving goal 1 in year 2030.

4. Local & International Demand for Rice

Demand for paddy in Sri Lanka increases by 1.1% per year and which requires production to be increased by 2.9% per year. Sri Lanka currently produces 2.7 million of rough rice annually and satisfies around 95% of the domestic requirement. Rice provides 45% total calorie and 40% total protein requirement of an average Sri Lankan. According to the statistics there is deficit of 5% from the national requirement and the district income source is having a higher potential in paddy production.

Unlike maize and wheat, most rice tends to be eaten where it is produced and so does not enter international markets. Yet, the volume of international rice trade has increased almost fourfold, from 7.5 million tonnes annually in the 1960s to an average of 28.5 million tonnes during 2000–2009.

In the international rice trade, a relatively small number of exporting countries must interact with a large number of importing countries. In the first decade of the 2000s, the top five exporters had 81% of the world market (up from 69% in the 1960s). Since the 1980s, Thailand has consistently been the world's largest exporter of rice, followed by Vietnam and India.

based on the projections made by the Food and Agricultural Policy Research, the global rice demand is expected to rise up to 496 million tons in 2020 and up to 555 million tons in 2035. Especially the demand on the Asian rice market is projected to account for more than 60% of the total rice demand increase, despite of decline of consumption in China and in India. Also, in Africa, 30 million tons more of rice will be needed to meet the increasing demand of more than 100%, compared to 2010. In addition, in the Americas the total rice consumption is projected to rise with more than 30% over the next decades.

All above explanation gives the evidence of continues demand for rice in internationally and shows that if produce more there is a huge market within island and the internationally.

Country	Year	Variable	source	value	unit
Sri Lanka	2017	Export quantity	USDA	5,000.00	Tonnes
Sri Lanka	2017	Import quantity	USDA	400,000.00	Tonnes

Table 5.5: Imports and export rice

Source : <http://ricestat.irri.org:8080/wrsv3/entrypoint.htm>

5. Agritourism concept specialize for paddy culture

Agricultural tourism is a commercial enterprise at a working farm or ranch conducted for the enjoyment and education of visitors, and that generates supplemental income for the owner or operator. In the tourism world there is a huge trend in this topic (figure 5.23) and Polonnaruwa can practice it with existing infrastructures as well. Only need the proper guidance for local farmers and tourism sector stakeholders.



Figure 5.24: Paddy related Agri tourism in Vietnam

Source: <https://img.theleader.vn/thumbs/788x0/upload/vananh/2018/5/23/cay%20lua.jpg>

5.1.4 Goal 1: Threat

1. Decline of heritage tourists to Sri Lanka

Tourist arrival for Sri Lanka can be divided into 10 types. Pleasure/holiday take the higher percentage. When studying the statistics from 2006 there is around 9% decline at 2016 by religious and cultural related factors. Which shows the threat for the goal no 1? (Figure 5.20: Percentage distribution of tourist by purpose of visit 2006-2016)

5.2 Goal (2)

Protection of Historic and Environmental sensitive areas.

Strength	<ol style="list-style-type: none"> 1.Heritage city Declaration 2.Ruins With a great History 3.Already protected Environmental sensitive areas 4.Central Cultural fund programmed
Weakness	<ol style="list-style-type: none"> 1.Infrastructure Development projects in eco sensitive areas 2.None availability of clear boundary demarcation of reservations
Opportunity	<ol style="list-style-type: none"> 1.Government trends towards environment protections 2.Political willingness 3.Arrival of tourists to Sri Lanka 4.list of Heritage cities 5.Agri tourism concept specialized for paddy culture 6.Low probability of natural disasters
Threats	<ol style="list-style-type: none"> 1.Drought situation

Table 5.6: SWOT for Goal (1)

Source : UDA, District Office Polonnaruwa

5.2.1 Goal: 2 Strength

1. Heritage city Declaration by UNESCO

Since the area declared as a world heritage city itself giving a protection of the area. The decline or change of the selected criteria can delisted as a world heritage city and it resulted a strong protection to the sites.

2. Ruins under Archaeological Department and Central Cultural Fund programmes

The Polonnaruwa sacred city declared by Ceylon government gazette no 7831 of march 3 1931 and Ceylon government gazette no 10222 of march 9 of 1951. Total land area is 446 ha. From that 243 ha is developed to exhibition level. The area is already protected by law.

The ruins inside the site is conserved and maintain by Central cultural fund. Inner city north side wall conservation, inner city east wall conservation, Parakramabahu palace, Lankathilaka image house, paintings of Jayamaha temple, and many other ruins are included to CCF list.

3. Already protected Environmental sensitive areas

The total urban area consists of 31% of paddy land. Those are protected under agrarian development department. And 15% belongs to the Flood plain national park under the department of wildlife conservation.

5.2.2 Goal 2: Weakness

1. Infrastructure Development projects in eco sensitive areas

The development pressure is high in the Kaduruwela commercial city centre and heritage city. Many surrounded land uses are low lands and paddy lands. In last 5 years around 2% of paddy lands filled to implement infrastructure projects. Ex: 100ft bypass road to A11 at Kaduruwela National Kidney Hospital etc.

2. Not availability of clear boundary demarcation for reservations

There are tank reservations, archaeological reservations, wildlife reservations in the urban area. From them only archaeological site has the clear physical boundary. The other reservations are easily encroaching due to the lack of awareness. And in Sirisangabo pedesa, Nishshankamalla pura and Ethumalpitiya area has higher issue due to the encroachments of heritage site.

5.2.3 Goal 2: Opportunity

1. Government trends towards Environment Protections (2030 Agenda for Sustainable Development”).

The United Nations 2030 Agenda for Sustainable Development is the new agreementsigned by the world. It has 17 goals, 169 targets to be achieved by 2030. Out of 17 goals 11,12,13,14,15 are directly about environmental protection.



Figure 5.25: Sustainable Development Targets

Source: Sustainable development 2030

5.3 Goal (3)

To make a pleasant & comfortable living in the tropical environment for residents & the commuters.

Strength	<ol style="list-style-type: none"> 1. Pibidemu Polonnaruwa programme, 2. Already protected Environmental sensitive areas, 3. 90% of houses have home gardens 4. Existing Solid Waste Management system, 5. Existing irrigation & Infrastructure Network
Weakness	<ol style="list-style-type: none"> 1. No proper drainage system, 2. Unbearable Temperature in city Centers, 3. Reclamation of the critical elements in the hydrological system, 4. Less awareness about alternative road network.
Opportunity	<ol style="list-style-type: none"> 1. Political willingness 2. Low probability of natural disasters 3. Town east of Polonnaruwa water supply project
Threats	<ol style="list-style-type: none"> 1. Drought situation

Table 5.7: SWOT for Goal (1)

Source : UDA, District Office Polonnaruwa

5.3.1 Goal 3: Strength

1. Pibidemu Polonnaruwa Programme

The main purpose of the Pibidemu Polonnaruwa development programme is to upgrade the city dweller living condition and in several sectors. From total development Programme 27 numbers of projects are planned to provide social and physical infrastructure facilities to achieve that target. Annexure 01 shows the list of projects which directly support to goal 3.

2. Already protected Environmental sensitive areas

A tropical climate in the Köppen climate classification is a non-arid climate in which all twelve months have mean temperatures of at least 18 °C (64 °F). In tropical climates there are often only two seasons, a wet season and a dry season. Tropical climates are frost-free, and changes in the solar angle are small. In tropical climates temperature remains relatively constant (hot) throughout the year.

In order to achieve comfortability in tropical climate require more green spaces. And to absorb sudden heavy rain it requires much low land to bare surface water runoff. The urban area is having Parakkrama Samuddraya and around 4 small tanks, 15% wildlife forest area, 400 ha of heritage city with green forest, 31% paddy lands spread all over the city.

3. 90% of houses have Home gardens

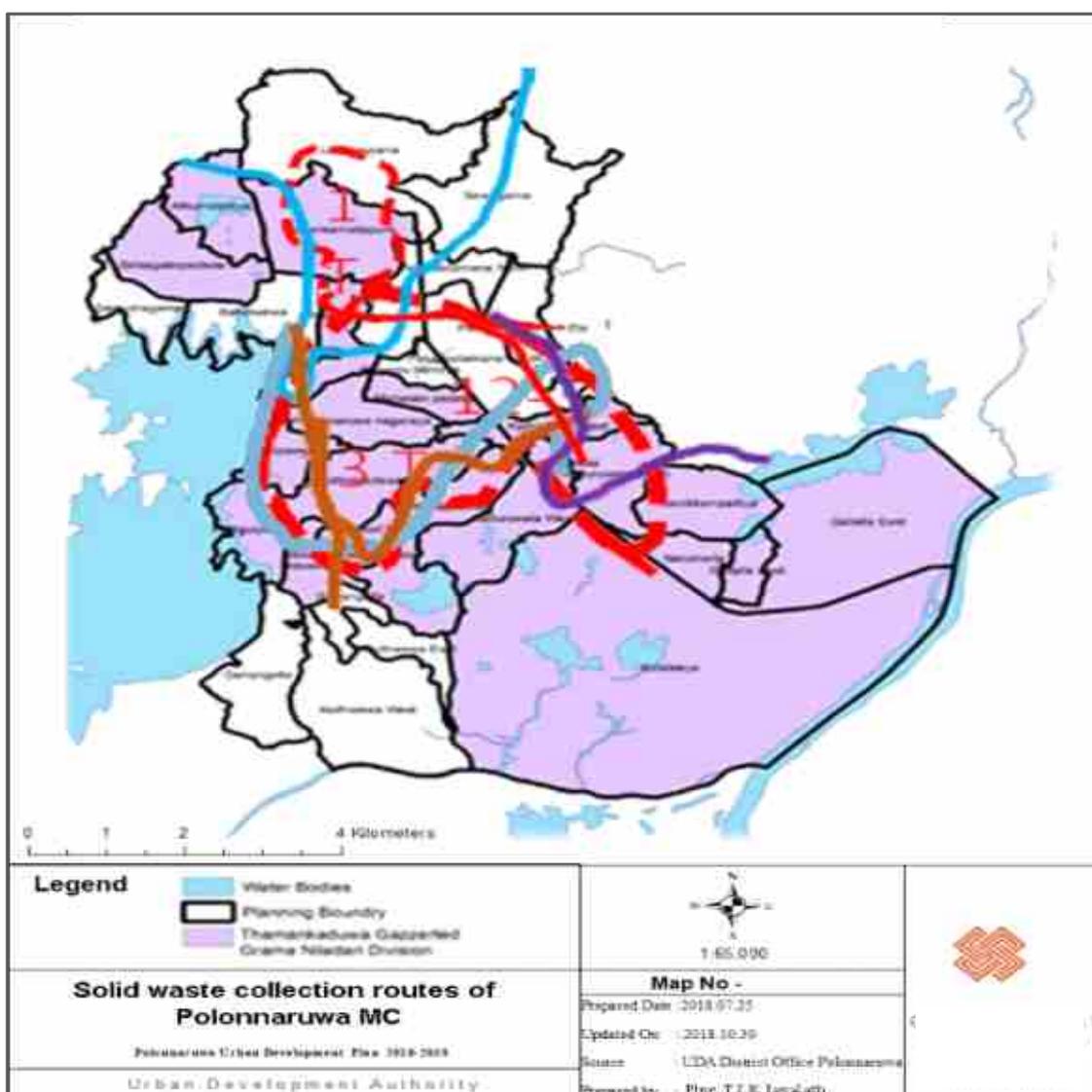
Other than the commercial city centre and Polonnaruwa junction, all other places have residential units with a home garden at lease consist of 2 large trees. It's a huge strength in to the goal 3.

4. Existing Solid Waste Management System

There is a well-planned solid waste collection method in the area. 12-13 Tones generated per day from town area and 1 Tons per day from sacred area. Waste is collecting from tractors daily. The local authority is only collecting waste if those are separated in degradable and non-degradable way. Comparatively 100% houses are separating in rural area, urban area is having common dustbins and only 50% in urban area waste is separated.



Figure 5:26 Type of waste collected from urban area
Source : Polonnaruwa MC



Map 5:1 Solid waste collection routes of polonnaruwa Mc

Source : Polonnaruwa MC

Route	Villages
Route 01	Bandiwewa, 23 post, Dobigama, Circular Road, Sewagama
Route 02	Paththini Pedesa, Govt Quarters, Akkara 500, New Town road, 4 th Cannel road
Route 03	Tourist Hotels, Beta 03 Rd, Hijra Mv, Bank place, Parakum Peadesa
Route 04	28 post, Kotalawala Rd, Coop Rd, Manik place, Muslim Colony, Manikkampattiya
Route 05	(Night) Polonnaruwa Kaduruwela Main road

Table 5.8 : Solid waste collection routes of polonnaruwa Mc

Source : Polonnaruwa MC

5. Existing irrigation & Infrastructure Network

The comfortable living in an urban environment is mainly depending on the level of infrastructure facilities, amenities in the area. In that sense the basic facilities already available in the urban area is strength for the goal 3. The well-connected road network is available within the city. The 86% of families use pipe bone water. All houses have 98% electricity supplies. From whole district the best services (educational, health, and other services) are available to residents of the city (Annexure 17 to 21). The irrigation system is spread whole over the area. In dry season water distributed from Parakrama Samudra main outlet to other irrigation channel network and it also support to the ground water table.

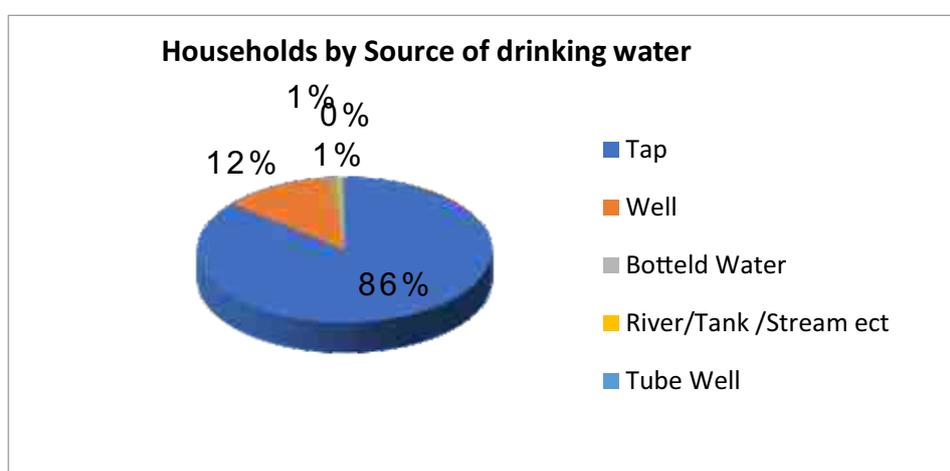


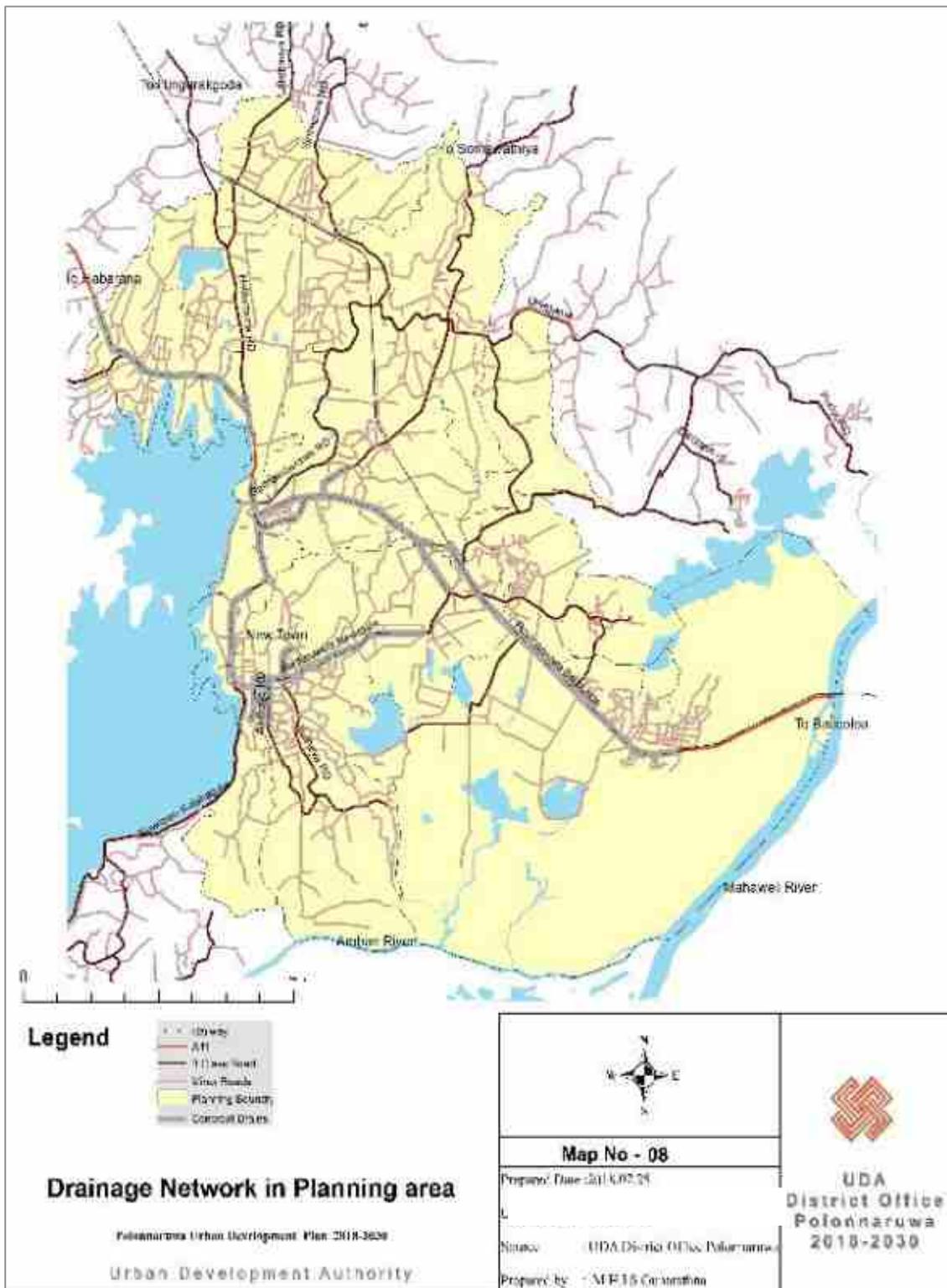
Figure 5.28: Drinking water usage

Source: *Divisional Secretariat*

5.3.2 Goal 3: Weakness

1. No proper drainage system

According to the Field visit and Surveys done by UDA district office Polonnaruwa it has identified 2/5 housing units have some issues regarding Drainage. Concrete drains available only along Main roads. ongoing Road improvement increases the height of road and many Houses are now in lower level. All the other area covered by Earth drains and those are not well maintained and filled in many parts. Waste water drainages are not available and in commercial city waste water mixed with rain water and inundates the home gardens.



Map 5.2: Drainage Network

Source: field visit reports, UDA Polonnaruwa District office



Figure 5.29: Photographs on existing drainage facilities

Source: Field Visit-2018 May

2. Unbearable Temperature in Town Centres

Since Polonnaruwa is belonging to the dry zone of Sri Lanka and naturally it has high temperature in day time such as 28c to 32C. But especially the Kaduruwela commercial centre is having increased temperature around 5C due to several reasons and it created the urban heat island effect. The main reasons for this effect are,

The air ways blocked by buildings

The wind direction fully blocked to Main Street throughout the year with its formation. Driest time of the area is yala monsoon May to August. And the North East monsoon is the same. The natural wind direction blocked with buildings and no any spaces between buildings. For an example the left side on A11 road having 1st cross street in 655m from starting point of Kaduruwela commercial city when comes from Polonnaruwa hospital junction. The blocking of wind by buildings also inhibits cooling by convection and prevents pollutants from dissipating. Waste heat from automobiles, air conditioning, industry, and other sources also contributes to this.



Figure 5.30: The air direction of city in May to August (Yala monsoon)

Source :<https://www.accuweather.com/en/weather-glossary>

- **The building materials**

The main cause of the urban heat island effect is from the modification of land surfaces. Dark surfaces absorb significantly more solar radiation, which causes urban concentrations of roads and buildings to heat more than suburban and rural areas during the day; materials commonly used in Kaduruwela town for pavement and roofs, such as concrete and asphalt, have significantly different thermal bulk properties (including heat capacity and thermal conductivity) and surface radioactive properties than the surrounding areas. Waste heat generated by energy usage is a secondary contributor to increase the town temperature.



Figure 5.31 : actual temperature and real feel

Source: <https://www.accuweather.com/en/weather-glossary>

- **No green shades**

Kaduruwela lose the shade and cooling effect of trees, and the removal of carbon dioxide. Trees are a necessary feature in combating the urban heat island effect because they reduce air temperatures by 10 °F or 5.5 °C, and surface temperatures by up to 20-45 °F or 11-25 °C.

The heat island effect can be counteracted slightly by using white or reflective materials to build houses, roofs, pavements, and roads, thus increasing the

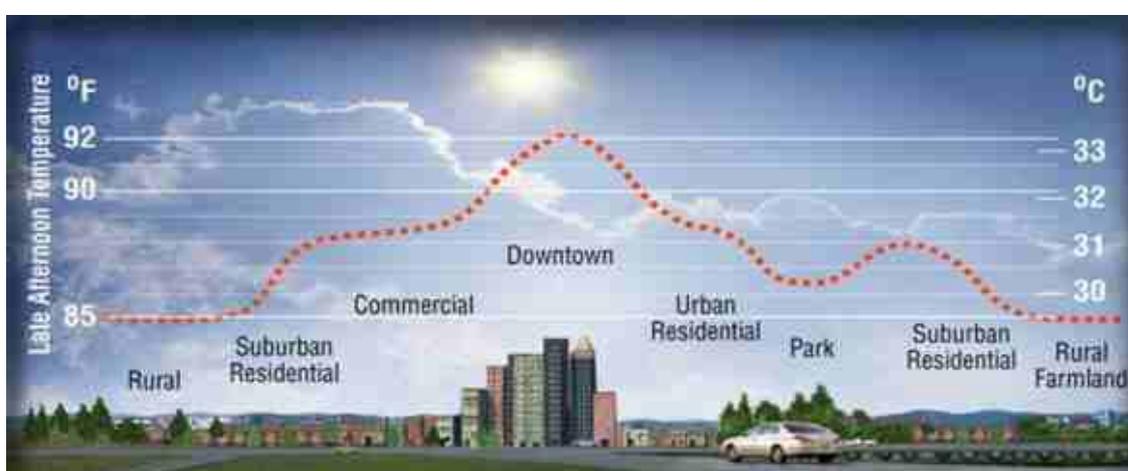


Figure 5.32 : The Heat Island Profile

Source: https://heatiland.lbl.gov/sites/default/files/front_slideshow/heatiland-main_0.jpg

3. Reclamation of critical elements in the hydrological system

The Polonnaruwa urban area located in comparatively flat terrain. And water flowing in very low slope. Because of that a small disturbance can damage whole hydrological system. Parakrama Samudraya and irrigation channels, rain water drainage, and paddy fields are playing main character in the system. The paddy field absorbs the water and spill over water going through the small channels and collated in small tanks. The rainwater from urban area also flows to paddy fields. The ongoing infrastructure projects such as 100ft A11 road and town expansion project filed 32 acres near to commercial city and the effects of that still unpredictable.

4. Less awareness about alternative road network

High traffic congestion along A11 road can be seen throughout the day time. Daily commuters and bypassing vehicles are there. According to the surveys it identified that to circulate between main three nodes 95% of vehicles using the main routes. When observing the road network of the area it can be seen many alternative roads are available to bypass one node and go another. The problem lies with the awareness about alternative routes. For an example there are 3 sub routes to link Kaduruwela commercial city and heritage city avoiding hospital junction. But only 5% of vehicles are using them.

5.3.3 Goal 3: Opportunity

01. 'Town east Polonnaruwa water supply project' by water supply and drainage board.

According to the present water demand whole Thamankaduwa DS division needs 16 100m³ per day. Total Polonnaruwa district required 80000m³ per day. This calculation is based on the assumption of per capita water demand is 120l per day and from that 8% is industrial and 10% of Commercial demand from domestic requirement. IF consider population growth rate 1.5% from 2012 census Thamankaduwa DSD demand in 2030 will be 19500 m³ per day.

With this Town East Project Thamankaduwa DSD will cover 65% of the total requirement of the area and increase the capacity of the existing water treatment plants at Gallella up to 13500m³/day, Polonnaruwa 6500m³/day. Existing water supply and with Town east project water supply for future city will be fulfilled. And the water quality of distributed water by water board has proven the water source will not affect for increase the kidney diseases.

Location	Present demand (m ³ /Day)	Supply (m ³ /Day)	Planned capacity in future (m ³ /Day)	Water source
Gallella	10100	8800	13500	Mahaweli river
Polonnaruwa	5000	3800	6500	Parakrama Samudraya

Table 5.9: Water Treatment Plants in Polonnaruwa urban area by NWS&DB.

Source: Lab reports of water sources in Polonnaruwa district by water supply and drainage board 2017

01. Low probability of natural disasters

The Polonnaruwa urban area recorded comparatively fewer disasters than other many cities of the country. Drought, Flood, High Wind and lightning are recorded as disasters in Polonnaruwa area (Annexure 11). And no any recorded deaths. Each year in December the flooding has high effect in urban function due to the blocking in Manampitiya by Mahaweli River. According to the predictions with Moragahakanda project there will be no flood at Gallella area in future.

In addition to that, droughts are affecting to the paddy cultivation of whole district in dry season. But since main water source is Mahawali river the water supplies to the area remain unchanged. With construction of Moragahakanda reservoir the Parakkrama Samudraya is filled and it can continue the water supply for irrigation channels in dry season. It will increase the ground water table and droughts will not affect badly to urban area in future except the temperature level.

5.3.4 Goal 3: Threats

1. Drought and high wind situation

The climate change of world can be a threat in order to achieve comfortable living in urban area. Since the area is situated in tropical climate whatever changes in reduce the temperature of the city can be low impact if global warming increases rapidly. The high winds recorded in once 30 years and after 1996 there is a potential of occurring it again at 2026 likewise the bad effects of climate change with have high impact on whole district social, physical, and specially economically. Polonnaruwa urban area as main service centre of

Disaster Events - Thamankaduwa DSD, Polonnaruwa District From 2017									
Event	Year	Month	Events	Deaths	Injured	Houses Destroyed	Houses Damaged	Affected	Evacuated
DROUGHT	2012	4	1	0	0	0	0	2478	0
DROUGHT	2014	8	1	0	0	0	0	6174	0
DROUGHT	2016	8	1	0	0	0	0	9475	0
FLOOD	2006	1	1	0	0	0	0	683	683
FLOOD	2006	12	1	0	0	0	0	746	0
FLOOD	2007	12	12	0	0	0	1	3423	0
FLOOD	2012	12	1	0	2	26	53	6159	0
FLOOD	2014	1	1	0	0	0	0	48	0
FLOOD	2014	12	1	0	0	0	2	8029	0
FLOOD	2015	10	1	0	0	0	0	11	0
STRONG WIND	2008	3	1	0	0	10	12	110	0
STRONG WIND	2011	5	1	0	0	0	5	0	0
STRONG WIND	2011	10	1	0	0	0	5	0	0
STRONG WIND	2015	10	1	0	0	0	56	227	0
STRONG WIND	2016	4	1	0	0	0	44	220	0
STRONG WIND	2016	5	2	0	0	0	6	29	0
TOTAL			28	0	2	36	184	38712	683
There is no any Cyclone reported during these date range									

Table 5.10: Disaster Events, Thamankaduwa DSD, from 2006 2017

Source: Divisional Secretariat Division-Annual Report, Thamankaduwa

CHAPTER 6: THE PLAN



6. THE PLAN

6.1 Introduction

Polonnaruwa urban area to become *green glorious heritage city in kingdom of rice by 2030*, it required well planned strategic movement. In order to provide new economic opportunities and achieve comfortable living in the tropical climate, its need to preserve the identity of city as heritage for paddy culture and ruins while protection of natural environment. improve liveability, connectivity and beautification Will help to attract more local and foreign tourist to the city while comfort city dwellers as well. The optimum utilization of existing infrastructure networks will ease the hardship of achieving the vision.

A concept plan developed to transform vision in to the physical form at city space. And Seven strategies developed to cover each and every aspects of urban planning targeting three goals and ultimately the vision 2030. Economic development strategy is the core strategy and other strategies developed to support economic development strategy. Culture and management strategy will improve the identity of city and social & physical infrastructure development strategy will provide services, facilities, amenities in achieving the vision. Environment sustainable strategy will strengthen the protection of sensitive areas and comfort living in tropical climate.

At a glance, the planning tools and techniques collaborated to practise 5000 years paddy culture to be use as another heritage in order to be the best heritage tourism destination in 2030. that will harness the potential of world tourism trend called 'Agri based tourism'. The existing paddy farm related activities, old technologies used in paddy industry, old Irrigation technology, new paddy processing factories, old equipment's, machineries, social values, habits, ethics, norms and believes will be available to experience at the city in 2030 for foreign and local tourists. Different type of old and new Rice categories will be available for eat and buy at the city. The residence of the city will be able to generate income through homestay with less investment since there lifestyle already belong to paddy related culture. The city will be a wealthy, healthy and adorable heritage city in 2030.

6.2 Concept Plan

To achieve the vision of “Green glorious heritage city in kingdom of rice 2030” developed the concept plan for the city. The concept plan is a vision on physical form and can be explained as future spatial structure of the city. To identify a proper spatial structure, it has been studied the evolution of town and existing spatial form of the town with along the sensitivity, liveability and potential analysis of the city.

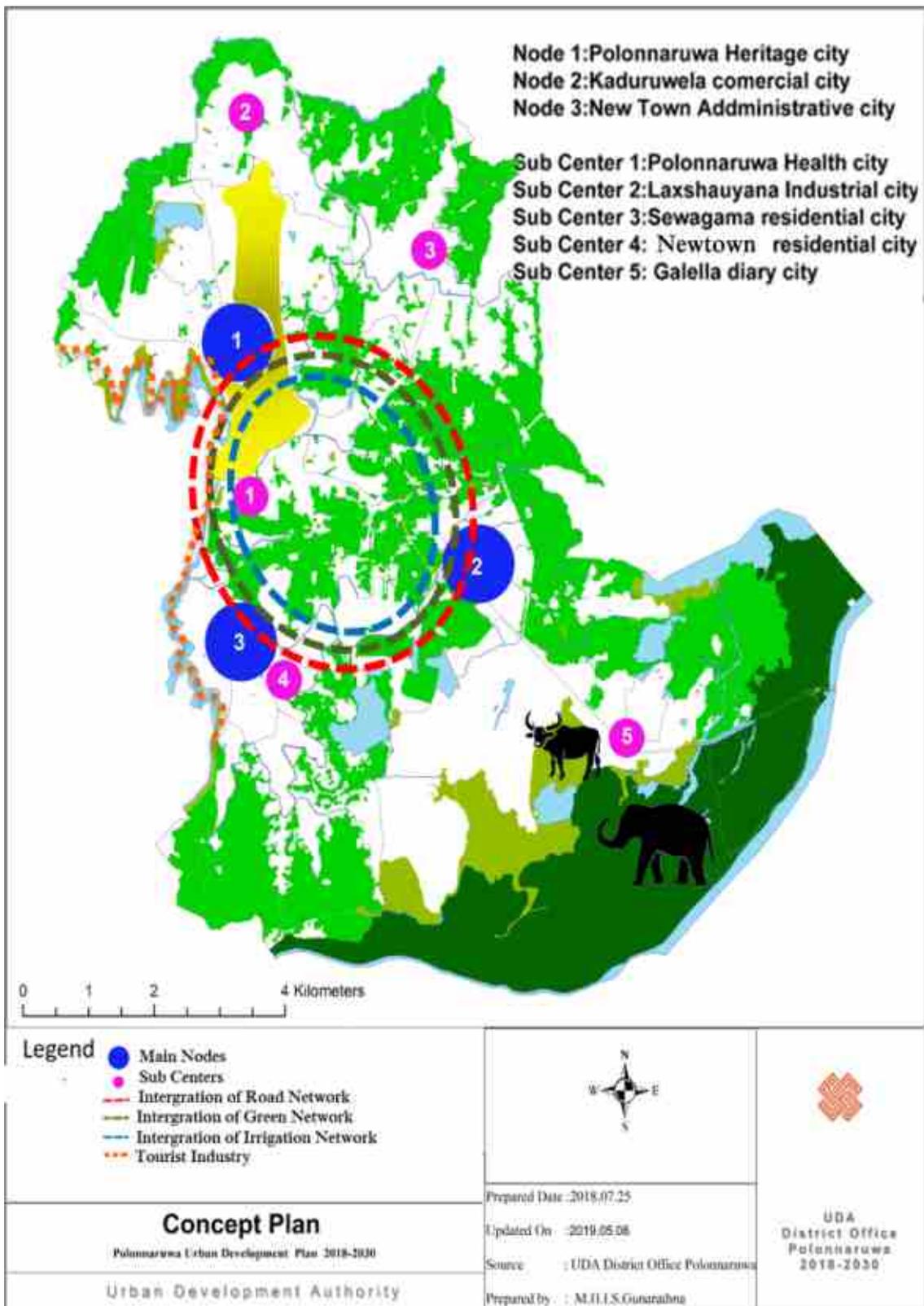
After analysing advantages and disadvantages with available options, finalized the concept plan to Continue Existing Spatial Form with improvements as three main nodes and five sub centres. The proposed spatial structure will Preserve the Paddy lands and sensitive areas while facilitating the Commuters of the city for each use. It's easy to utilize the existing Infrastructure networks in optimum way and it will create more economic opportunities for industrial/commercial activities & comfortable residential spaces by 2030. The main nodes and sub centres are as follow. (Map 6.1)

1. Main Nodes

1. Polonnaruwa Heritage city
2. Kaduruwela Commercial City
3. Newtown Administrative city

2. Sub centres

1. Polonnaruwa Health cluster
2. Laksha uyana industrial cluster
3. Sewagama residence cluster
4. New town residential cluster
5. Gallella diary cluster



Map 6.1: The Concept Plan

Source : UDA District office, Polonnaruwa

6.3 Proposed Land Use Plan

The proposed Land use plan of Polonnaruwa 2030 has finalized ensuring to achieve the vision, “Green Glorious Heritage in Kingdom of rice”. And it will ultimately accomplish five requirements described in need of the plan (chapter 5).

New town administrative city, Polonnaruwa Heritage city and Kaduruwela commercial city will remain as the main nodes and will maintain three different characteristics while developing them for the betterment of Polonnaruwa city. In terms of having more tourist attraction to the city it has planned to improve whole infrastructure systems in area. But in order to protect natural environment, 'paddy lands', 'heritage city' and 'flood plain natural reserve' will remain as non-developable area.

The proposed zoning plan is the main planning tool used to achieve anticipated land use of the area. The land use plan has been displayed using three separate sections (AB, CD, EF) within planning area (Figure 6.4). By these sections it can be easily comprehend the land use pattern and its spatial arrangement vary

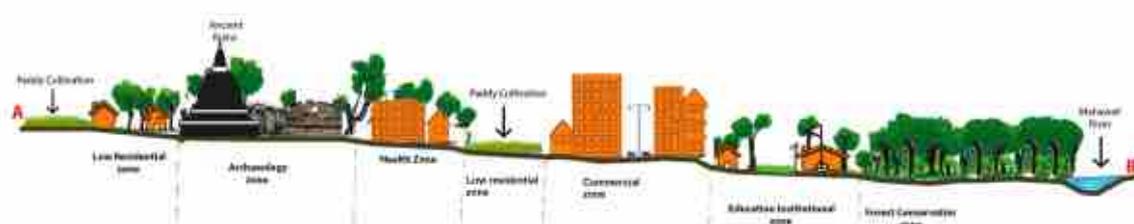


Figure 6.1: Section AB

Source : UDA, Polonnaruwa district office

under respective zones in planning area. (Figure 6.1, figure 6.2, figure 6.3)

when entering to the city from Colombo Habarana A11 road, visitors will feel low density residential zone and greenery. Then with beautiful view of Parakrama Samudraya and Deepauyana Park they can experience a beauty of the heritage city. With view of cycling foreign tourist and walking people at Polonnaruwa junction can feel more urbanized character with heritage.

Form their Moving forward to hospital junction will change the feeling of heritage to more active urban space with health cluster. With experiencing green paddy fields and low residential zone can move to commercial city of Kaduruwela. The area will be filled with high raised building and much densified built-up area than other zones. The cross roads which connected to paddy field will improve the wind circulation of the road and will be much walker friendly city for pedestrians. Again, passing commercial city towards to Batticaloa will reduce high-rises and flood plain national park will come up with

forestlands at the end. the institutional zone at Gallella will filled with moderate density of buildings which are mainly for institutional purpose.

Section CD (Figure 6.2) covers spatial arrangement of low Tourism zone, Administrative zone, Moderate residential zone, Low residential zone, Commercial zone, Mix Development zone and Low residential zone. Low residential zone with paddy lands next to commercial city will help to control the heat in the city centre by opening wind corridors. Tourism zone around Parakrama Samudraya will enhance the scenic beauty and the compatibility of the zone and it also attract more tourists into the city. Indirectly it helps to open up the wind into the city and reduce the heat of the sacred city. Low residential zone identified at the D corner due to the annual flood risk.



Figure 6.2: Section CD

Source : UDA, Polonnaruwa district office

Section EF (Figure 6.3) covers spatial arrangement of Industrial zone, Archaeological zone and Tourism zone. Tourism zone attached to Archaeological zone will benefitted by tourism industry used as a strategy to conserving natural environment and heritage value of those zones. Industry zone will be a mixed area of urban structure surrounded by paddy fields.

There are separate Floor Area ratio (FAR) and Plot coverages identified for variety of urban land uses as a strategy. Therefore, different level of densities zone through rules and regulations.



Figure 6.3: Section EF

Source : UDA, Polonnaruwa district office

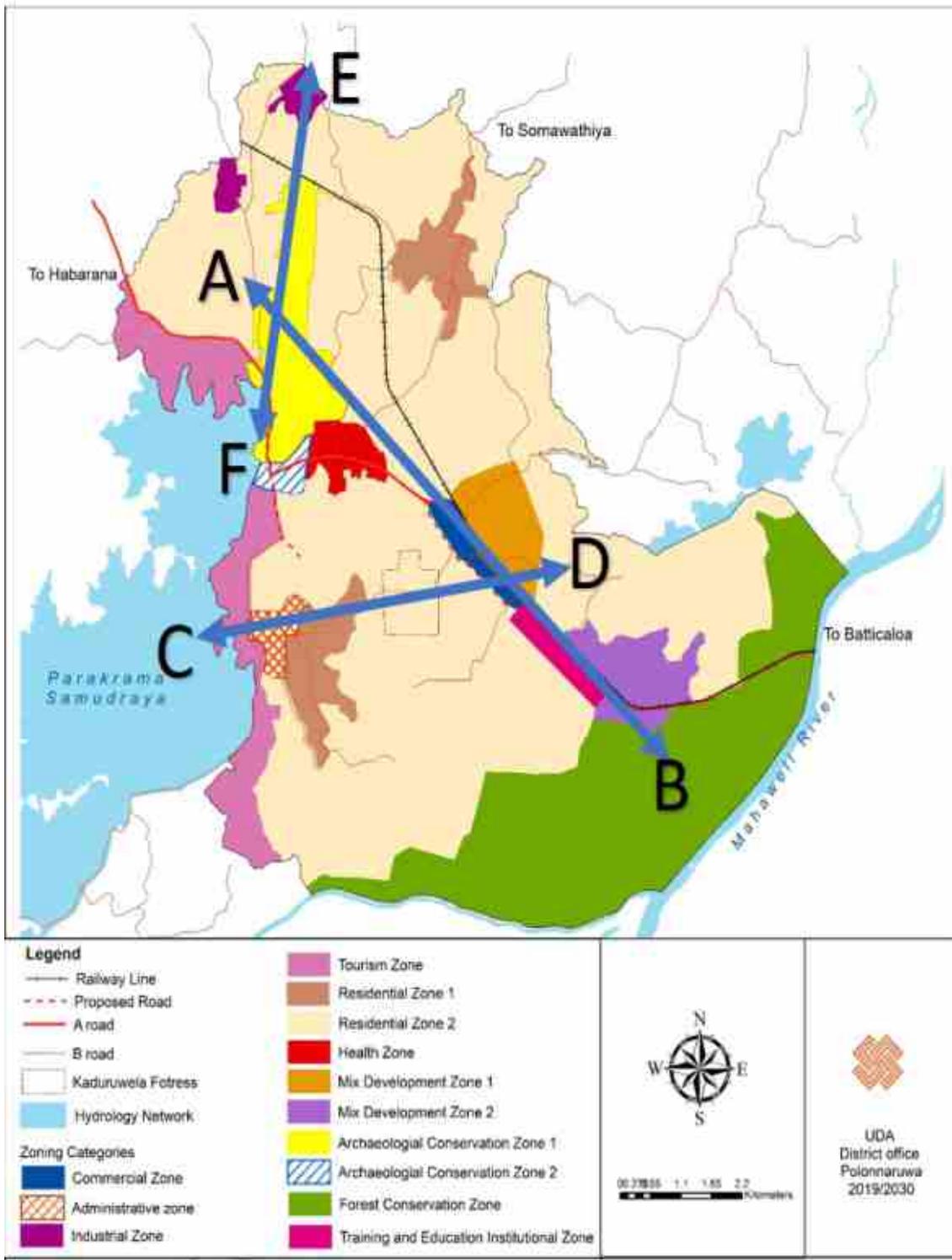
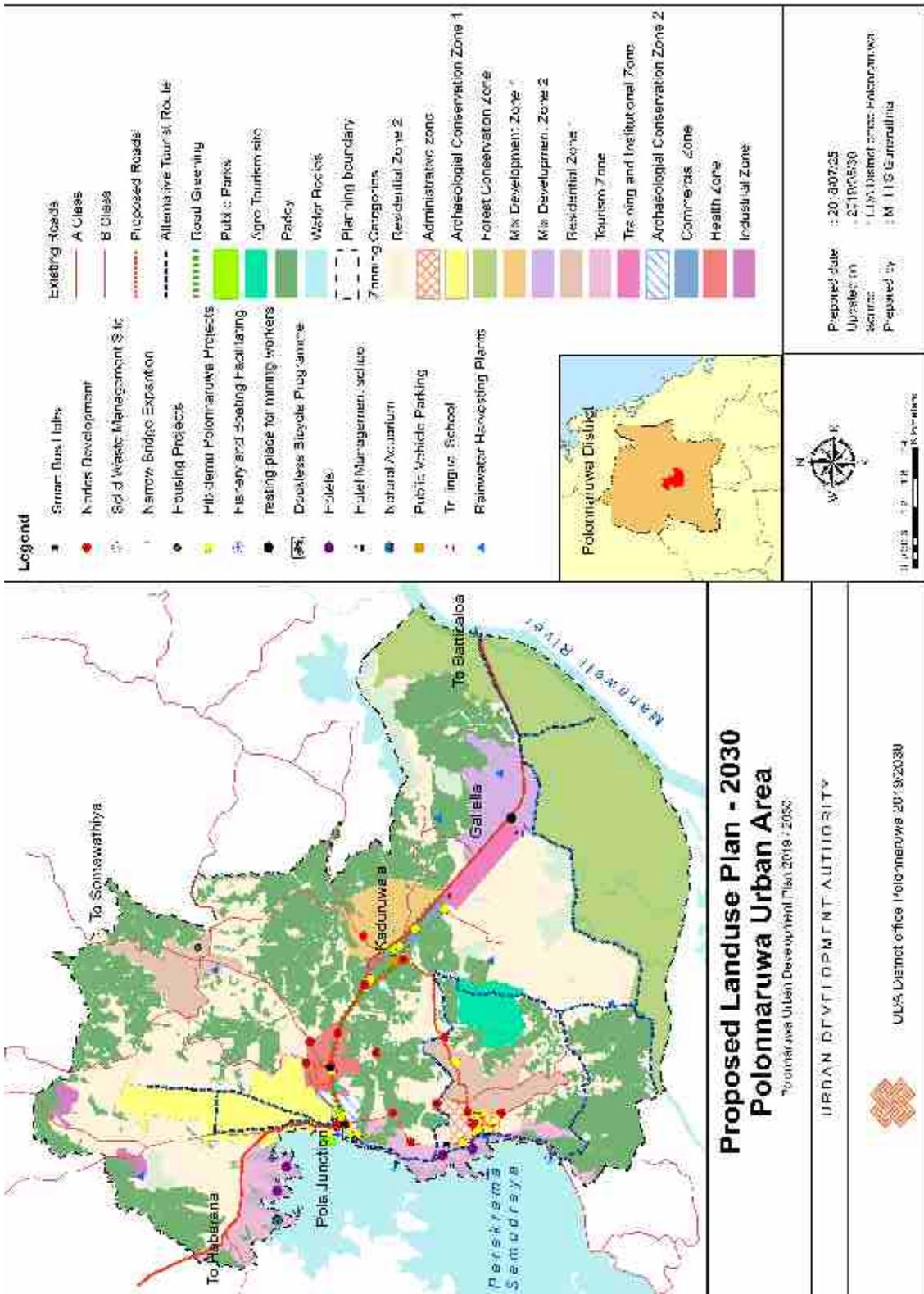


Figure 6.4: Cross sections of the city on Zoning map – 2030

Source : UDA District office, Polonnaruwa



Map 6.2 : Proposed Land use – 2030
 Source : UDA, Polonnaruwa district office

6.4 Strategies

The Overall Polonnaruwa Urban Development plan is a combination of all interventions of seven broader strategies as mentioned below.

6.4.1 Economic Development strategy

6.4.1.1 Identification of main Economic Drivers and Predictions

Economic Development strategy serves as a blueprint for the city's economy. It lays the foundation for sustained economy recovery and fiscal stability for the city. Also, will collaborate on employment, investment and quality of life initiatives. The purpose of Preparation of Economic strategic plan is to provide better living environment for the people of the city while getting untapped potentials into the economic process. The better living environment is achievable through facilitating the growth of the economy, protecting the natural and built heritage and improving the quality of life for all inhabitants.

North Central Province contributes 5.12% to national GDP. The contribution of GDP for each sector from North Central Province is separately Agriculture 8.73%, Industries 3.67%, Services 5.34 % (Annexure 11). The labour force distribution in Polonnaruwa district by each sector is Agriculture sector 45%, Services 45% and only 10% for industries (Annexure 12). Unemployment rate of Polonnaruwa district is 2.5 in 2016 (Annexure 13). National unemployment rate of the same year was 4.4. Therefore, Polonnaruwa district has comparatively low unemployment rate. within the Polonnaruwa planning limit the employment percentage from total population is 55%. Therefore, the unemployment rate from total population is 45%. About 49% out of total families is only getting Rs. 5000-25000 income (Annexure 14).

Following are the main economic drivers which can be identified in the Polonnaruwa city

1. Ancient Ruins with a great history which enhance the Tourism,
2. City Situated In between Grand tour route and Existing road network,
3. paddy production and processing units (Rice Industry),
4. Identical environmental (forests and hydrology network) hotspot in closer proximity to city,
5. Labour Force.

More details of aforesaid economic drivers have discussed in the chapter 5, detail analysis of the SWOT. Table 6.1 shows the predictions related to economy in Polonnaruwa.

Activity	Existing	Proposed
Tourists arrival	697 persons per day	2154 persons per day
Paddy land	31.71 km ²	32.02 km ²

Table 6.1: Predictions related to the economy

Source: CCf data and analysis

6.4.1.2 Proposed Economic Strategic Plan

The vision of Polonnaruwa Development plan 2018-2030 is “Green Glorious Heritage City in Kingdom of rice”. Heritage city and kingdom of rice are two identities and key potentials of the city which can use to boost the economy of the city. But According to the existing development pressures, there are possibilities of delisting the city from UNESCO world heritage list due to declining its characters and as a Heritage city.

An integrated and comprehensive physical development plan can overcome aforesaid threats and create Polonnaruwa city as a healthy wealthy and adorable Heritage city. The economic development Plan has been prepared to Upgrade City Dwellers economy with Paddy industry and tourism, more spaces for industrial Development and Optimum utilization of existing Infrastructure networks.

Demarcating separate zones for industry and tourism will give an encouragement to promote existing paddy processing industries and tourism related activities in respective zones. In order to get the optimum deliverables some models will locate in outer side of above zones to create more economical opportunities to whole city dwellers as well. Paddy culture related Museum, irrigation museum, historical paddy culture practising eco village for tourist (ex: Ulpotha eco village. Dambulla) will give new income generation methods to inhabitants.

6.4.1.2.1 Identify separate zone for Tourism around Parakrama Samudraya and introduce new projects

Promoting tourism industry is one of greatest support for enhance the city economy. Polonnaruwa as one of world heritage city, it is necessary to highlight the uniqueness to get more tourists attraction. Considering their needs and interests, following strategies have been identified to enrich the city economy.

A. New Star class Hotels and regularizing existing hotel

Although there are more than 100 of hotels around sacred city (small scale to large scale) Most of them are not registered with Tourist board. Preparing stakeholders inventory with local authorities and registering them with tourist

the demand and future tourist's arrivals, four large scale star class hotels have proposed in this tourism plan near to Parakrama Samudraya. The hotels must keep their carbon footprint at lower rate and the structure need to be blend with natural environment well. (Figure6.5)



Figure 6.5 : Star class hotel which blend with nature
Uga Escapes Yala/Sri Lanka

Source: <https://www.ugaescapes.com/destinations/yala.html>

B. Recreational and commercial Fishery and boating services

Inland fishery is also a one of famous industry in Polonnaruwa which help to enhance the city economy by both commercial and recreational fisheries. So, this strategy will promote Recreational fishery for tourists and commercial Fishery for local community by introducing fishing locations and facilitate those locations around Parakrama Samudraya (figure 6.6). Bay areas of Parakrama Samudraya has identified to introduce recreational swan boat facilities (figure 6.7 / map 6.3)



Figure 6.6: Fishing at Parakrama Samudraya

Source: <https://manishamishra.files.wordpress.com/2012/04/i>



Figure 6.7: Swan boat service at Gregory lake, Nuwaraeliya

Source: <https://www.dhanushamarinelanka.com/img/about/paddle-500-swan-07.jpg>

C. Introduce Dock less bike sharing programme through online system

Dock less bicycle sharing is a way which is reduce the traffic inside the sacred city and also increase the health of people while they enjoy the heritage city. Relevant Bike-Sharing Applications can use to track nearby bikes and scan their QR code in order to unlock them. Charges may apply per hour when the person start the journey. This method will ensure the security and transparency of both buyer and seller. Also, this will encourage tourists to park their vehicles outside the sacred city and feel the antient ruins while enjoying the bicycle ride. (Figure 6.8)



Figure 6.8: Dock less bike sharing

Source: <https://altaplanning.com/dockless-bike-share/>:

D. Natural aquarium and fresh water fishing village

This natural aquarium is proposed by associate with Parakrama Samudraya to experience onsite aquatic life. This proposal was to highlight the uniqueness of Polonnaruwa on inland fisheries. The setting will arrange in fishery village located in deewara gammanaya Bendiwewa. The natural aquarium will provide educational and recreational activities with fishing.



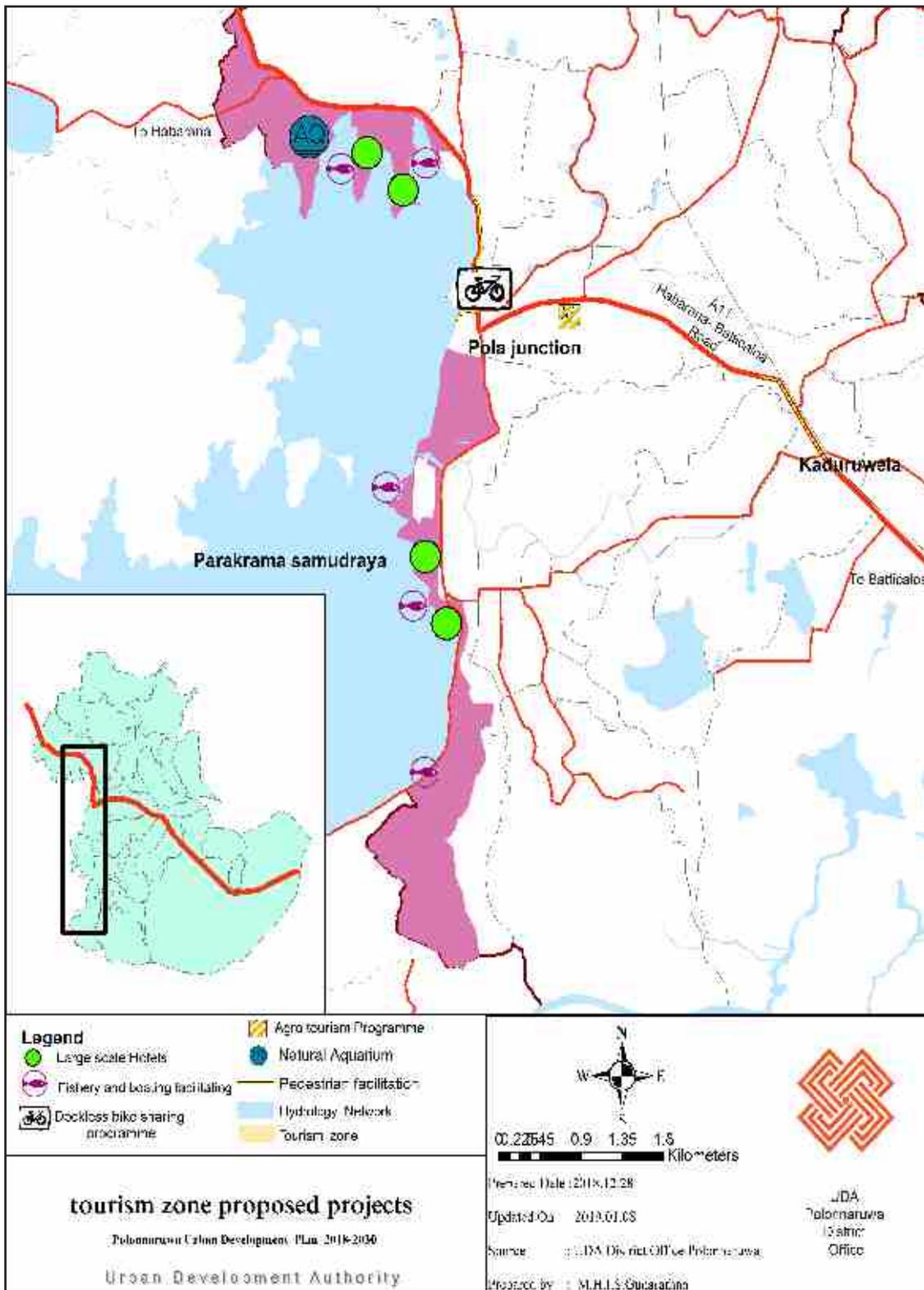
Figure 6.0 : The big muskie at the Freshwater Fishing Hall of Fame in Hayward, Wisconsin

Source: <https://media-cdn.tripadvisor.com/media/photo-s/01/3a/77/13/the-big-muskie-at-the.jpg>



Figure 6.10: Kids Freshwater Fishing Derby

Source: <https://www.gannett-cdn.com/-mm-/local/media/2018/04/08/Guam/Guam/636587486250118451-IMG-2669.JPG>



Map 6.3 : Tourism Strategic plan
 Source : UDA Polonnaruwa District office

6.4.1.2.2 Agri tourism programmes

According To description of university of California Small farm programme (<http://sfp.ucdavis.edu/agritourism/>) “The Agri tourism is a commercial enterprise at a working farm or ranch conducted for the enjoyment and education of visitors, and that generates supplemental income for the owner or operator”. In the tourism world there is a huge trend in this topic and Polonnaruwa can do with existing infrastructures as well. Only need the proper guidance for locals. The following strategic programmes will introduce as models which the city dwellers can follow in own lands.

A. Viewing Deck and Agri Tourism recreational activities (map 6.4)

Paddy lands enhance the attractiveness of Polonnaruwa city and it is the key element of Polonnaruwa. Currently there is no space for feel the real feeling of relaxation of paddy lands on site. Proposed “Viewing deck at Ranketha” (figure 6.11, 6.12) adjacent to A11 road in paddy land will let visitors to get the opportunity to sense the nature on site while walking on main road. And there will be paddy related activities to enjoy by tourist as well. the selected paddy land can be considered as a model paddy field that give a guidance for farmers who are willing to initiate such programmes within their own paddy fields in order to have extra income from tourism.



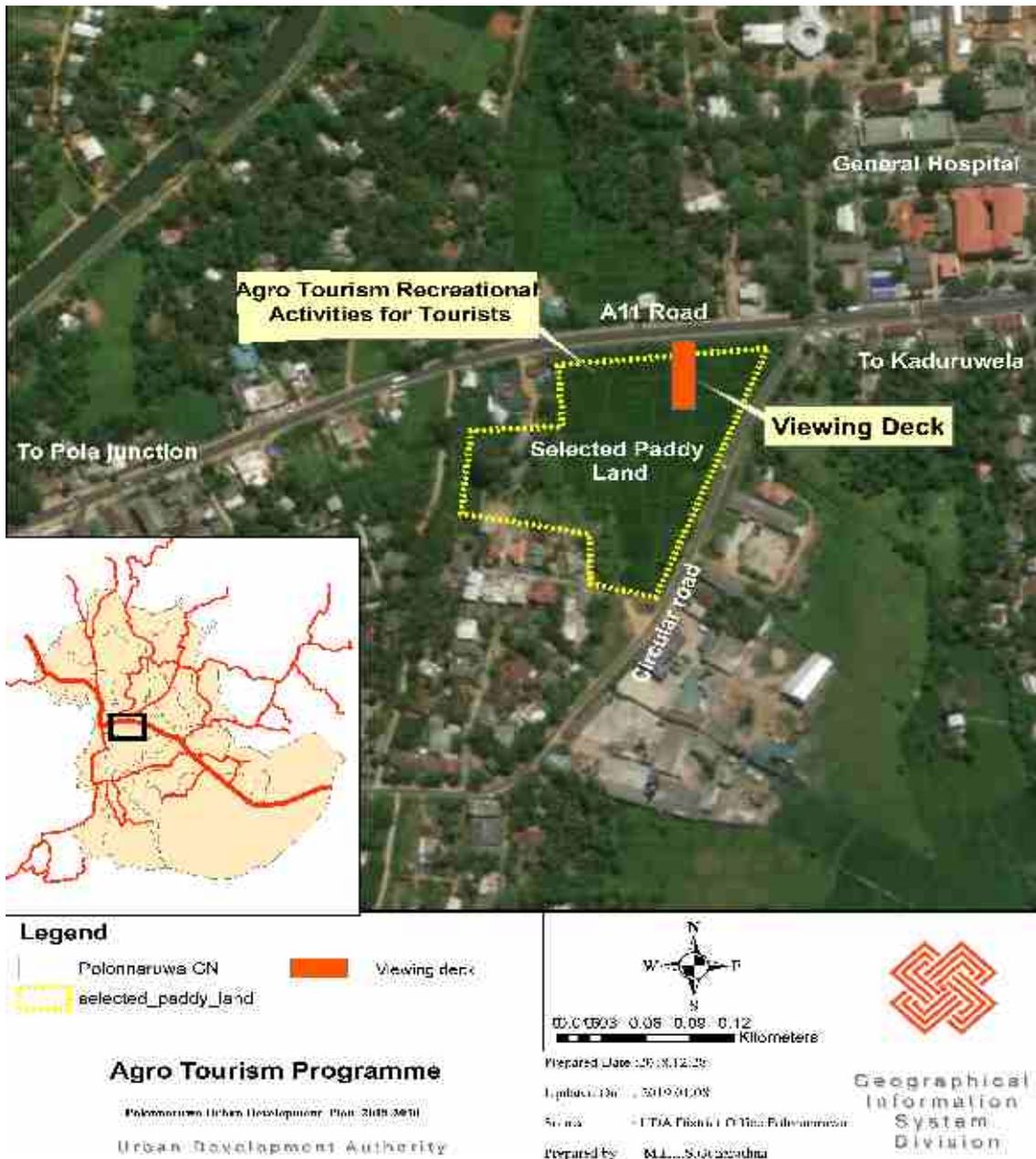
Figure 6.11 : Agri Tourism recreational activities in Veotnam

Source: Random Collection From Internet



Figure 6.12: Viewing Deck

Source: <https://www.thewilddeckcompany.co.uk/product-portfolio/viewing-platforms/>



Map 6.4 : Location of viewing desk and paddy for enjoy

Source: UDA Polonnaruwa District office

B. Practice Japan's Paddy Art, at Kaduruwela paddy fields



Figure 6.13 : Japan's Paddy art in Inakadate village, japan

Source: <https://krishijagran.com/news/japans-paddy-art-a-new-way-of-agritourism/>

The Inakadate, a Japanese Village is famous for this paddy art. When art becomes the theme of agriculture then it will be an exceptional masterpiece. Each farmland in Inakadate, a Japanese Village is a piece of art. The farmers of this village make detailed patterns by planting a different variety of rice to make an artwork. Each paddy field of this village has an artistic touch and it is a beautiful art in all manner. The themes vary every year and it ranges from mythical characters to Hollywood fame.

The artwork is created carefully by designing in the computer and genetically engineered variety of rice are carefully planted by the farmers. The local green leaf variety is carefully clubbed with dark red, yellow and white (genetically engineered) varieties.

There are many paddy lands in either side of the A11 road. One paddy farm which belongs to a Hotel and situated in Kaduruwela have selected to do this kind of paddy art. The attraction of it will make a trend in other paddy lands.

B. Irrigation museum with practical examples

detail explained in Culture and heritage management strategy. (Map 6.5)

C. Paddy Museum and a model village

detail explained in Culture and heritage management strategy. (Map 6.5)

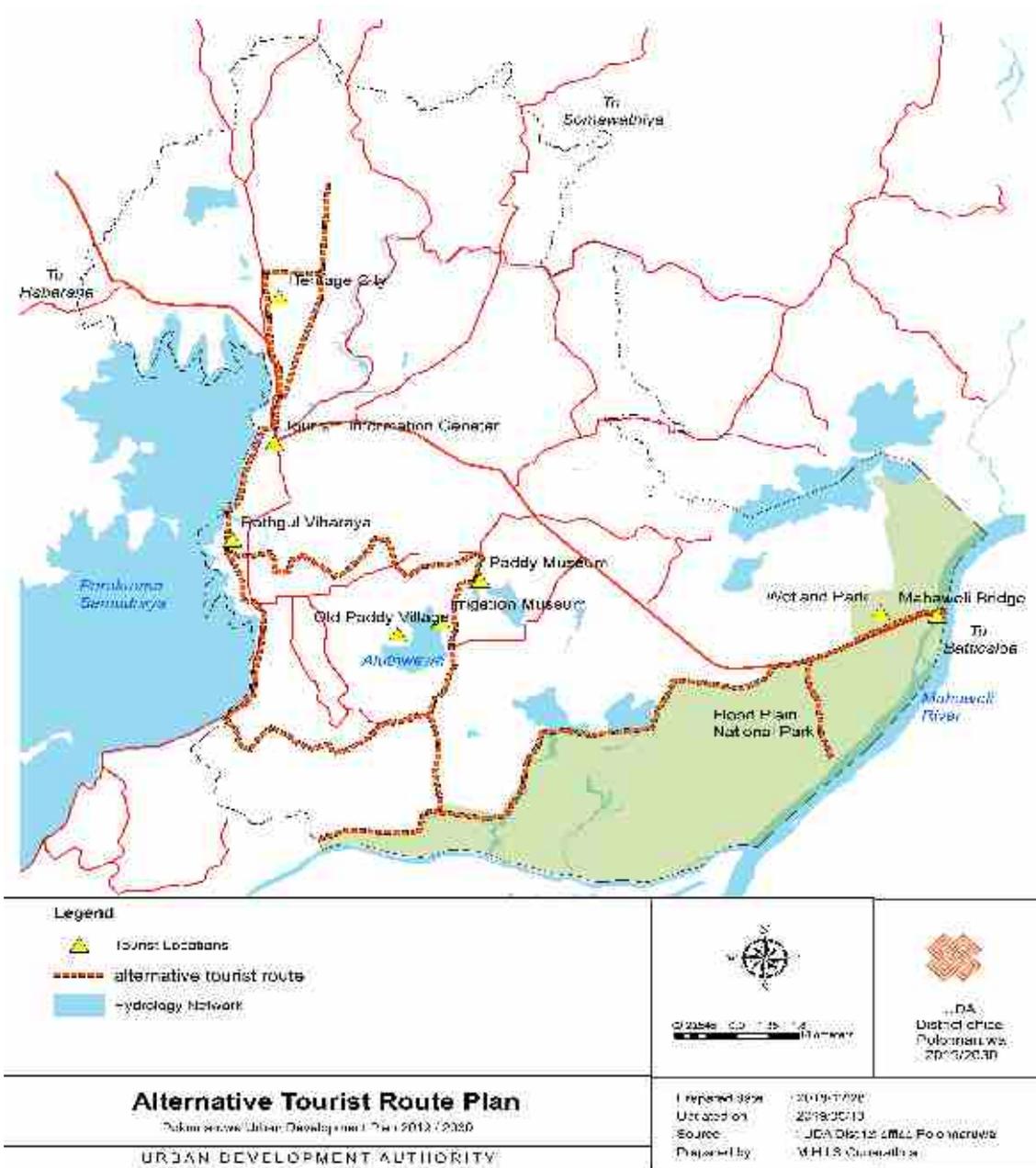


Map 6.5 : Irrigation Museum, Old paddy village and paddy museum

Source : UDA Polonnaruwa District office

6.4.1.2.3 Introduce an alternative tourism route to cover new tourist sites.

This Alternative tourist route has proposed to cover main tourists' locations such as Heritage ruins site, Parakrama Samudraya, Pothgul wehera, 3D museum, paddy museum and Agri village site, irrigation museum (described under agriculture plan) and Flood Plain national park Etc. Tourist Information Centre project which was initiated under Pibidemu Polonnaruwa programme as a proposal from the draft development plan of 2015 of UDA, has identified as the main benefaction point to introduce newly proposed projects and guidance on those places to tourist arrive to Polonnaruwa city.



Map 6.6 : Alternative tourism route
 Source : UDA Polonnaruwa District office

6.4.1.2.4 Industrial Plan (Manufacturing)

- A. Identify separate zone for Non- polluting agriculture based green industries
 1. Raw rice product industries
 2. Value added product industry
 3. Rice mills
 4. Polysac machine industry

Rice industry is most unique and key industry in Polonnaruwa city from decades back. Protecting and get involved paddy harvest in various mean for enrich the city economy is the main target of formulating this strategy.

Non-polluting Industrial Zone in Lakshayana (Green Industries) will enhance the capabilities of inhabitants by optimally using resources within the city and drive them towards to gain economic benefits on that.

Polonnaruwa still not taken the advantage of being the main city centre by passed in A11 road to connect with eastern region of the country. Recreation targeted tourist who pass the city for beach sides in east and even locals can be stopped with a strategic plan.

considering 54% of economically deactivate population, there will be commercial hubs targeting tourism industry within industrial zone, tourism zone and outer Archaeological zone which will promote local productions industries which can be attract by tourists.

Also, Infrastructure management strategy link with economic development strategy. Introducing parking facilities from a distance will lead tourists to walk and it will indirectly enhance the city economy. Also, the better connectivity in drainage, irrigation system and transport will improve the liveability of the city.

These strategies will lead to fulfil the gap which is mentioned under Need of the plan. Increase the production of paddy will perform to conserve current Paddy lands to protect the identity for paddy industry and boost the economy using zoning regulations. Also, it has promoted low density residentials mostly for farmers.

6.4.1.2.5 Economic Plan for Kaduruwela town expansion (Trade/ Commerce/ Finance/ Services)

Kaduruwela is the Commercial capital over 600,000 of threshold population of the district and surrounded area. At the moment it's seems that already it filled whole developable space covered from paddy area. Due to the demand in future the existing arrangement needed the rearrangement of the city centre. Following projects identified to fulfil needs of the area. (Map:6.7)

- A. Introduce Rice retail & large-scale wholesale market in Kaduruwela town, in order to widen up the market for the farmers to expose their productions into national level (annexure 33)
- B. Implement a Trade & Commercial centre to market agriculture products and other by products and also value-added products of Polonnaruwa
- C. Relocate CTB bus depot and that land will convert to two story building. Ground floor will be dedicated to public fair to facilitate specially bus travellers. The upstairs will

function as vehicle parking space. (Annexure 34)

D. Redevelopment of existing shops in the commercial belt to widen up the pedestrian paths and enhance the compatibility within the city

E. Financial complex development for all financial institutes at Kaduruwela

F. CTB Bus depot and distance travelling service centre will relocate near the entrance of Maithripala Sirisena Mawatha.

6.4.1.2.6 Economic Plan for New town

A. Mini bus stand and shopping complex

Since the new town functioning with whole administrative offices and district court and one national school at the centre there is a huge demand for a mini bus stand. The lawyers need more space for their offices. With considering demand, in front of the royal college entrance it has proposed mini bus stand with upstairs rooms for legal officers. The downstairs will have super market and communications and restaurant related shops.

6.4.1.2.7 Economic Plan for Polonnaruwa pola junction / heritage city

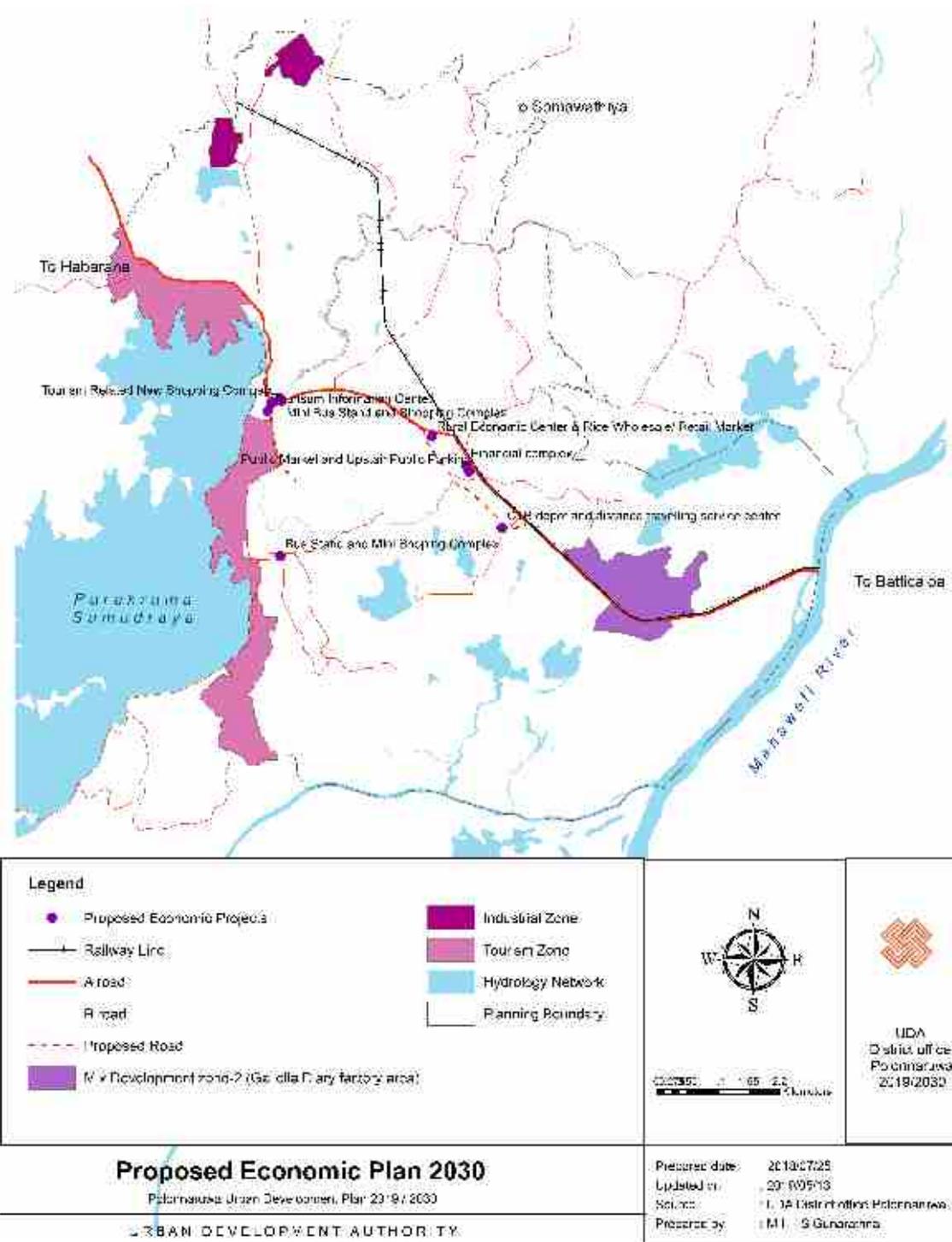
Polonnaruwa pola junction located within the old city and development is restricted by the regulations. But In order to provide better service for the tourists and daily commuters following projects have been identified. (Map 6.7)

A. Improvement of functions in tourism facility centre and include SMART banking units

B. Shopping complex at CCF land for tourism related activities

C. Mini bus stand and shopping area at in front of public square

D. Public urban square and restaurant area



Map No 6.7: Proposed Economic Projects

Source : UDA District Office Polonnaruwa

6.4.2 Culture and Heritage Management Strategy

6.4.2.1 Heritage Areas

Cultural and heritage types in Polonnaruwa can be identified under tangible and intangible categories as below.

- a. **Tangible**
 - I. Ancient Ruins (Archaeological zone)
 - II. Irrigation network/ cascade system
 - III. Paddy cultivations and technology

- b. **Intangible**
 - I. Paddy cultivations related culture, Norms, believes
 - II. Dalada Perahera (Poson Perahera)
 - III. Wesak Perahera

As the Polonnaruwa city is one of historical land mark in the country, it has a significant identity mainly in two ways. First one is Polonnaruwa is one of UNESCO World Heritage Sites of Sri Lanka.

Second one is Polonnaruwa can be identified as the Premier Paddy producer in the country in present. And in past also it has an enough evidence for paddy-based economy and a sustainable city in king Parakramabahu time. The well planned and maintained irrigation system interconnected with paddy culture. But presently, those identities are not optimally use for the benefit of the city. The sensitive areas such as heritage sites, irrigations and paddy areas of the city need to conserve and preserve in order to protect them and get those heritages engaged into enhancing the city economy by improving production and tourism sector.

Formation of the city is a result of historical actions it needs to have profound understand in preparation of urban development plan. Proposed Polonnaruwa Zoning plan 2030 have developed with including a separate zone for arkeological sites. Paddy lands and hydrology network also identified as sensitive areas which are need to conserve to protect the identity of the city.

6.4.2.2 Goals related to culture and heritage management strategy

Goal one and two are directly targeted the culture and heritage management. “To become best heritage tourism destination of the country, it needed to improve the identity of the city with its heritages. Green (Paddy and green environment), Blue (irrigation) and Heritage are the main characters that are going to protect and promote to achieve the vision under heritage management strategy. the objectives of goal one directly linked to achieve it. The goal two is to protection of the heritage and environmentally sensitive sites by demarcating boundary.

The vision of the development plan is “Green Glorious Heritage city in kingdom of rice”. Above goals will support to achieve the vision because it addresses the current need of the heritage city in a futuristic perspective. Vision itself highlight the Heritage city and rice industry because it is the identity of Polonnaruwa. So eventually these goals will lead to protect the identity of Polonnaruwa by following below strategies.

6.4.2.3 Proposed culture and heritage management strategic plan

6.4.2.3.1 Separate zones for Heritage city

The “Alahana piriwena” programme by the archeological department is currently own the land of sacred city. Out of 27 main Archaeological ruins 18 ruins has been identified to develop with protecting the archaeological value of them in the zone. No development is allowed in the sites than infrastructure for supporting the site by regulation.

6.4.2.3.2 Conservation and preservation the Heritage sites by physical demarcation of boundary.

- A. The UNESCO heritage city has threatened due to encroachments. The physical demarcation of boundary is must with survey department guidance.
- B. There are three medium sized tanks and around 45 small scale lakes in planning area which functioning according to the Ellangawa concept needed to demarcate boundary that can use the bio belt development concept as well.
- C. Paddy lands around the main roads need to be conserve specially from land filling. The regulations have made strongly to reduce the conversion and whole paddy area selected to the low residential zone in zoning plan.
- D. The land considers as “Wijithapura fortress /Kaduruwela balakotuwa” marked

in zoning map with special regulations in order to protect it until the archaeological department name it as a heritage site and do necessary excavations. It's located in Kaduruwela and weerapedesa grama niladhari divisions near to commercial city. (Figure 6.13)

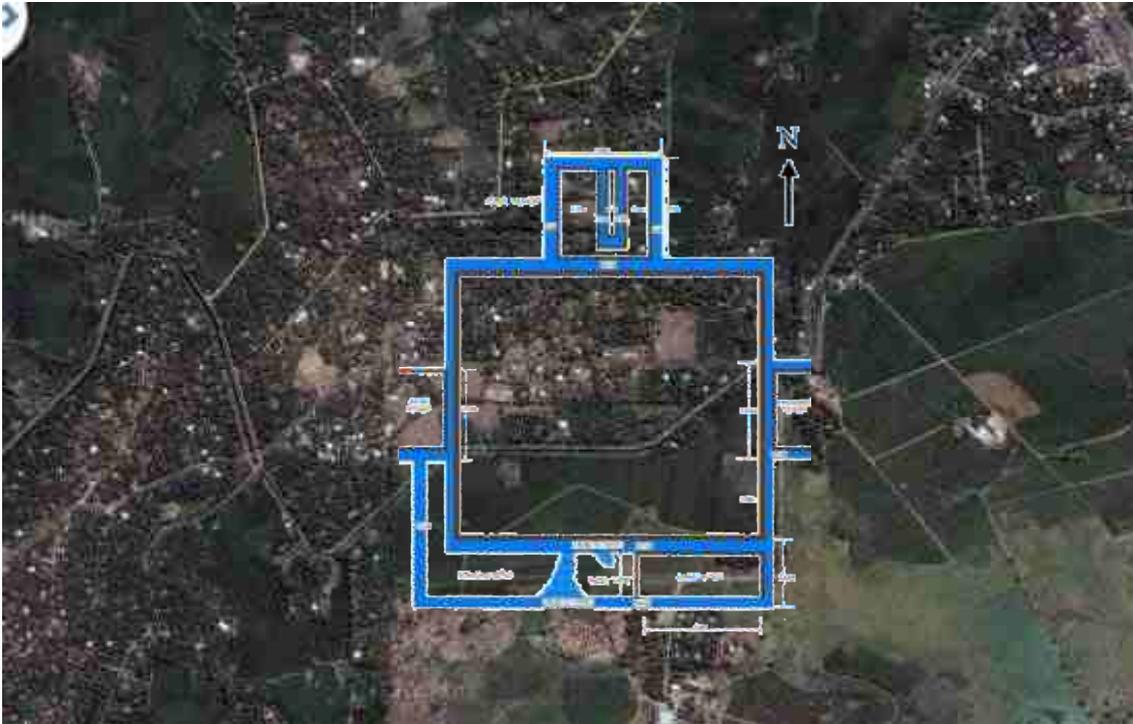


Figure 6.14 : Drfted Kaduruwela fotress using Googel satalight image by central cultural fund reasrch report 2010

Source:

<https://www.archaeology.lk/sinhala/%E0%B6%B4%E0%B7%9C%E0%B7%85%E0%B7%9C%E0%B6%B1%E0%B7%8A%E0%B6%B1%E0%B6%BB%E0%B7%94%E0%B7%80%E0%B7%9A-%E0%B6%9A%E0%B6%B3%E0%B7%94%E0%B6%BB%E0%B7%94%E0%B7%80%E0%B7%99%E0%B6%BD-%E0%B6%B6%E0%B6%BD%E0%B6%9A/>

6.4.2.3.3 City entrance and nodal point development

A. Development of main entrance points to the city with antient structure models to visualize cultural and heritage identity.

There are four main entrance locations have identified to the Polonnaruwa city. Those are,

- ✓ From Colombo
- ✓ From Somawathiya
- ✓ From Newtown
- ✓ From Kaduruwela

It is proposed to construct entrance gates which are elaborating the heritage uniqueness of the city. Considering the vision of Polonnaruwa heritage city 2030 plan has identified several historical ruins that expose the identity of the city which can use as a model for these entrance gates. Purpose of this proposal is to give a pre-feel to the people who are entering to the antient city.

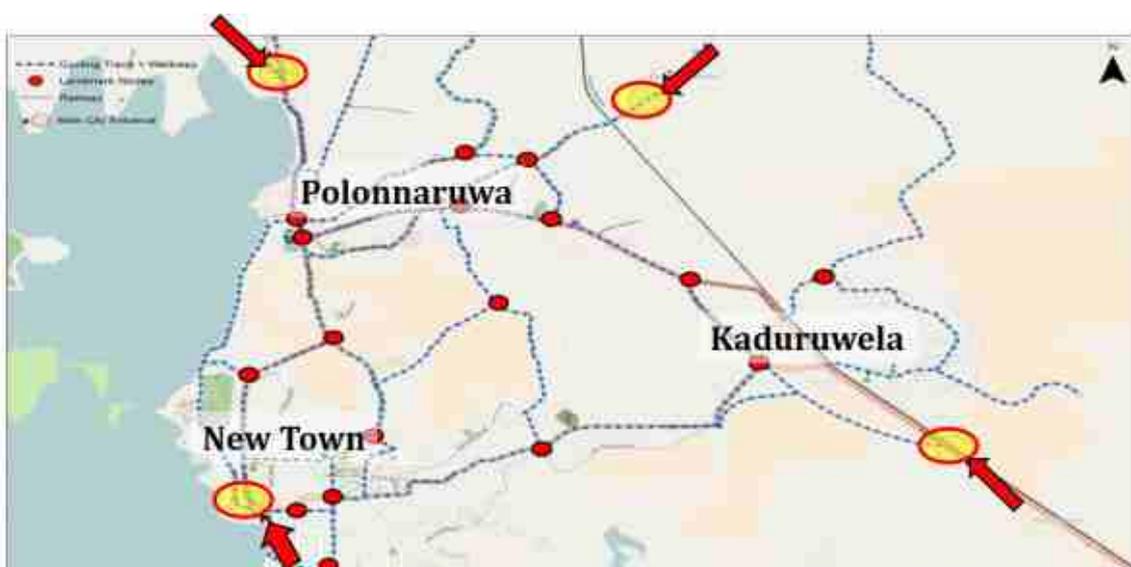


Figure 6.15 : Entrance points and main nodes to be develop as Land marks of Polonnaruwa
 Source: Field survey -2018 August -urban development Authority



Nishshankamalla Council building



Polonnaruwa Thiwanka Pilimageya

Figure 6.16 : Examples for suitable Antient structures

Source: <https://s3-ap-southeast-1.amazonaws.com/tripazing-prod/large/Thiwanka-Image-House-Polonnaruwa1530467342903-838732.jpg>
<https://c8.alamy.com/comp/J0DCJ0/the-ancient-lions-throne-in-kings-council-chamber-of-nissanka-malla-J0DCJ0.jpg>

B. Development of main nodes in road network with antient structure models to visualize cultural and heritage identity

King Maha Parakramabahu's time considered as The Polonnaruwa golden era. with vision 2030 we redeveloping that glorious city. In that sense the main nodes will create landmarks describing old elements. For example, following main nodes can be development with given landmarks bellow (Figure 6.16). In whole structure there will be an explanation of historical value and places where can see the original items. The structure size must be lager as a tourist can pose a picture with it.

- Maithripala Sirisena road starting point node (Kaduruwela entrance): can develop with King Parakramabahu's time Gold coin.
- Hospital junction Sungawila road entrance node: with surgical instruments which found in Alahana piriwena excavations
- Polonnaruwa Pola junction circle will be much bigger landmark with a height of 80 meters or more.
- New town entrance node: with old letters used in writing of books.



Figure:6.17 landmark For Node at Kaduruwela Polonnaruwa Massa coin

Source: https://www.cbsl.gov.lk/sites/default/files/cbslweb/images/notes_coins/Early%20Massa%20-%20Polonnaruwa.png



6.4.2.3.4 Regulate the constructions around the heritage city by maintaining its character

The archaeological conservation zone will regulate the development in the area restrict.

6.4.2.3.5 Improve the infrastructure facilities in Heritage city. (Annexure 27)

Archaeological Department has identified several projects for improve the infrastructure facilities in Heritage city. Conservation and preservation of selected heritage sites also included in the project list. The identified infrastructure development by CCF must maintain the character of Polonnaruwa heritage city while facilitating it for tourism.

The Polonnaruwa itself having hot temperature and direct sunlight in day time and it is much preferable by the tourists to open up sites at least up to 10.pm. with proper lighting systems will attract more tourist and locals with climatic comfortability at evening.in that sense the night time functionable infrastructure improvement is must in the site and with this development plan urban development authority will give guidance to the provide infrastructure in the arachnological sites.

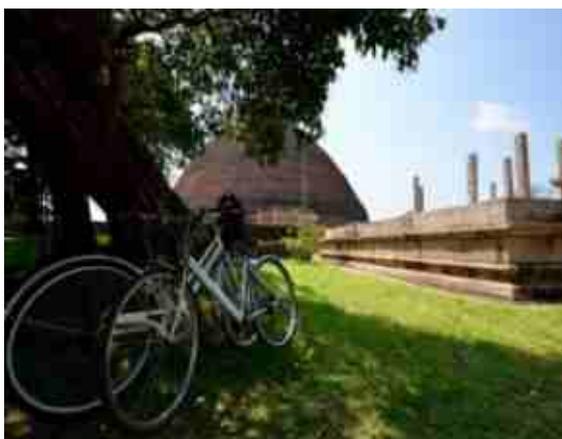


Figure 6.18 : need cycling friendly infrastructure

Source:

<https://www.atlasandboots.com/wp-content/uploads/2017/04/cycling-in-anuradhapura-sri-lanka-8.jpg>



Figure 6.19 : solar lighting facilities in Parakrama Samudra bund

Source:

<http://www.leadsunglobal.com/wp-content/uploads/2018/09/ParakramaSamudraya.jpg>

6.4.2.3.6 Landscaping the heritage city with flowering trees

The heritage reservation consisting about 4.2 km² with ruins and forest cover. landscaping with seasonal flowering will be a better option to improve the beautification of the heritage since the constructions are not preferred within the city. The peak time for foreign arrivals is June to august and the seasonal flowers like Esala (Cassia fistula/ golden shower) and Meyi Mara (Delonix regia) for those time can give priority. After five years the heritage city will be full these flowers and will create memorable journey to the tourist. Following locations have identified to plant flowering trees.

- A. The either sides of the inner roads
- B. Along Parakrama Samudraya A11 road
- C. As a physical demarcation to the heritage city

6.4.2.3.7 Hela bojun hala near sacred city (map 6.8)

“Hela bojun hala” near sacred city will attract both local and foreign tourists into the sacred city. Traditional Sriankan foods which prepare using traditional cooking tools will enhance the feeling of culturally environment of the sacred city. It will be also a timely solution for absence of food shop near sacred area.

6.4.1.1.1 Paddy Museum and a model village

The paddy related culture builds throughout 5000 years. It's a Heritage for new generation. Not only paddy farming technology there is a tradition and culture bond with people. Not only element of a village, Food preparation, cooking instrument, house constructions, paddy conserving methods, paddy processing methods and there are more. One village will be built with old characters and function as a model village about paddy related culture closer location to government seeds farm. tourists can stay in the village and can experience the culture. (Figure 6.19 Ulpotha village Dambulla). the management will be handling by the villager's group.

The museum will show each and every element including old technologies and paddy verities.



Figure 6.20: Ulpotha village Dambulla

Source: <https://www.ulpotha.com/>

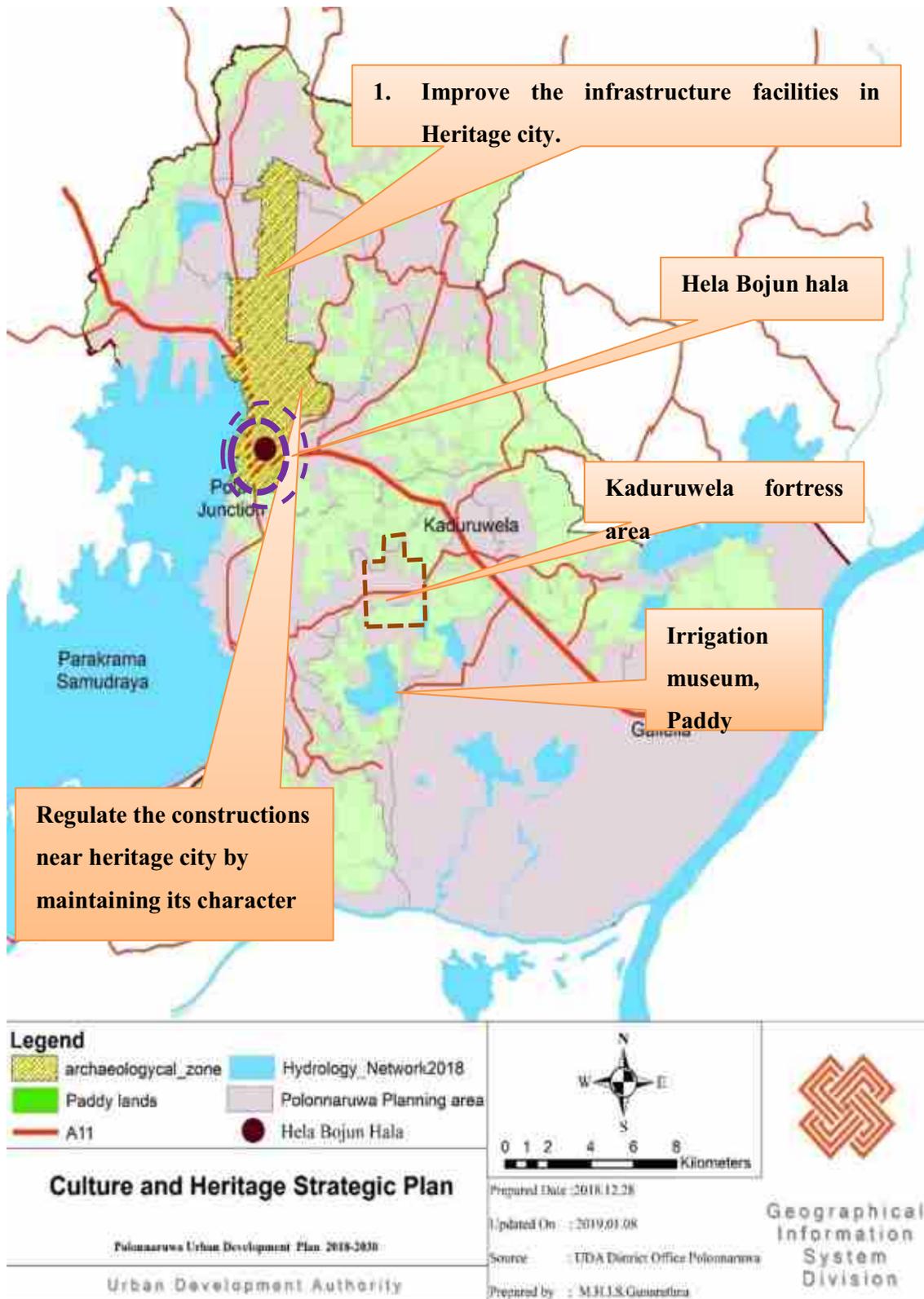
6.4.2.3.9 Irrigation Museum

The Sri Lankan traditional cascade system and irrigation technology has been world famous for centuries. But there are no proper institute to experience the knowledge at one place in Sri Lanka. Polonnaruwa has historical authority to display the old technologies as used it in maximum way to paddy culture. Consequently, in Kaduruwela Aluthwewa tank area will construct irrigation museum and Aluthwewa tank cascade system will develop as a practical model for cascade system. The irrigation museum, paddy museum and paddy village are located in closer proximity for better functioning. (map 6.5)

6.4.2.3.10 3D museum with historic library (including Kings statue, Present leaders, 3d technology)

In Newtown closer proximity to the Pothgul viharaya a 3D museum and new library has constructed under the Pibidemu Polonnaruwa development programme. It has proposed to create old king's statues and presidents of the country. The museum fully equipped with new technologies and will be a fantastic experience for the locals and foreigners' library is to study historical information.

Finally, Culture and Heritage strategy will lead the city to enhance the cultural sense of the city while promoting its uniqueness to promote tourism of the area. Paddy has considered as one of main elements of culture and heritage of the city. Refer Agri tourism plan in the previous section of 6.5 for more details.



Map 6.8: Culture and Heritage plan
 Source : UDA District office, Polonnaruwa

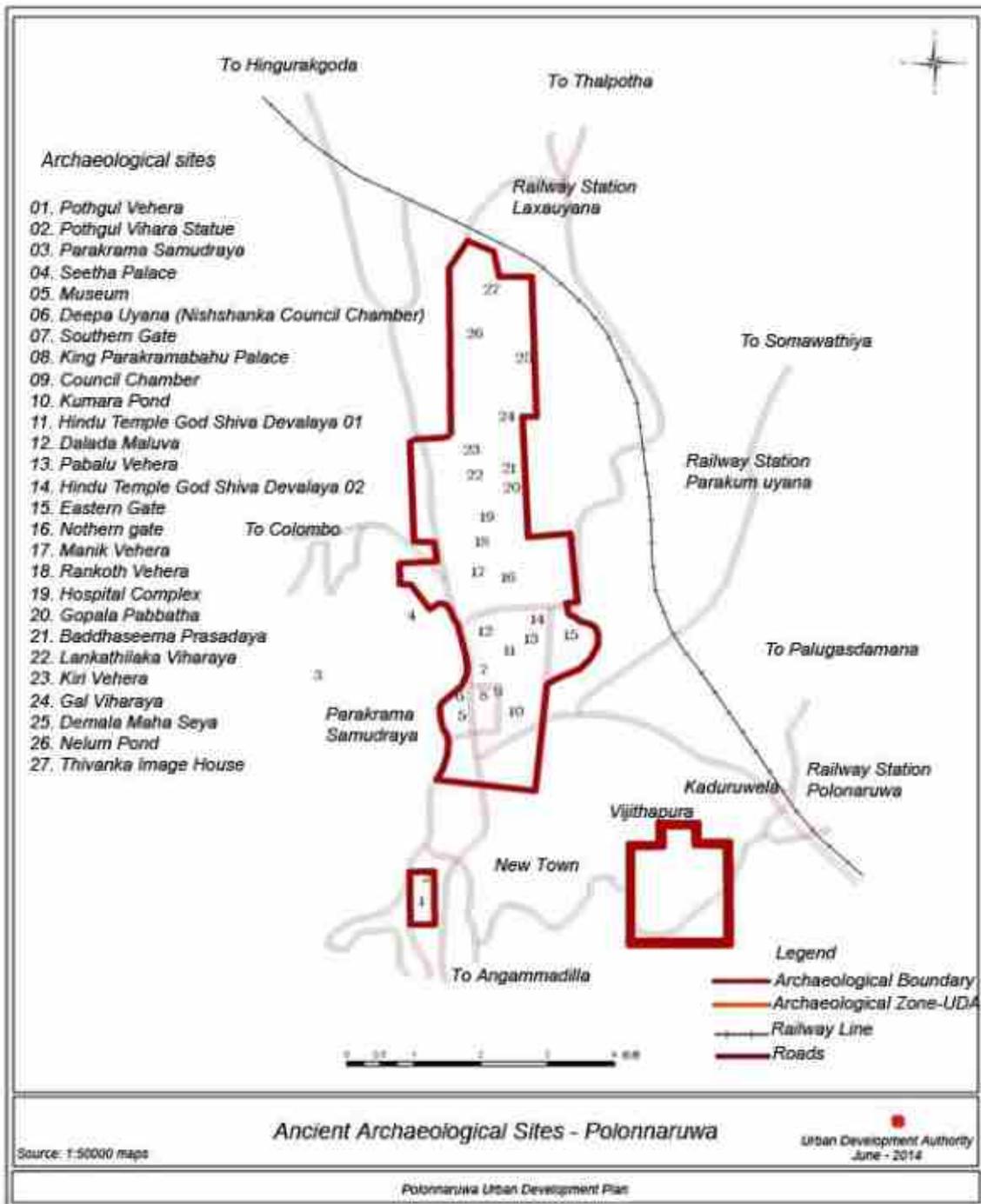


Figure 6.21: Ruins in Polonnaruwa sacred city

Source : UDA District office, Polonnaruwa

6.4.3 Social and Physical Infrastructure Development Strategies

This section Analyse the strategies under the Social and Physical Infrastructure Development to achieve the Vision of “Green Glorious heritage city in Kingdom of rice”. Proposed Service plan, Proposed Transportation plan, Proposed Water supply plan, Proposed Electricity and Data lines plan, Proposed Drainage and Sewer Lines plan and Proposed Waste Management plan have been identified under the Social and Physical Infrastructure Development Strategies.

6.4.3.1 Service Plan

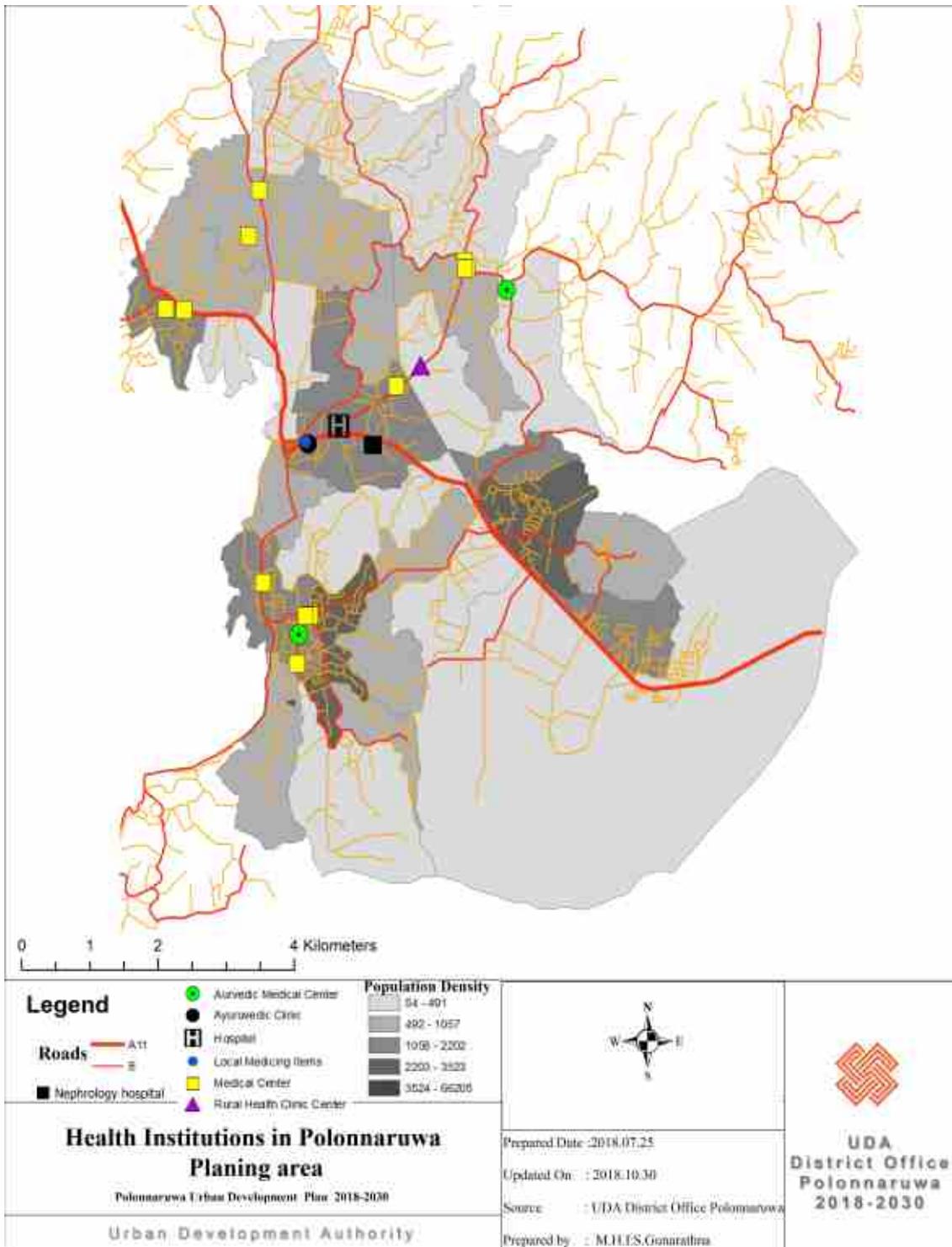
This Plan has been prepared to provide Health, Educational and Residential facilities, for the People, who lives in the Planning Area. The total land extent of the planning area is 103 Sq.km. and existing residential population of the area is 65329 (*Source: Sampath pathikada-2016*) and it has predicted to become 76905 in year 2030 with the annual growth. Apart from natural growth the attracted population with national level kidney hospital, tourism sector development and other infrastructure development as 100,000 residential population.

6.4.3.1.1 Health sector service plan

In social infrastructure aspect, health facilities are vital factor in Polonnaruwa district. The Land area of the Polonnaruwa General hospital, about 22 Acres and Buildings have spread about 85% of the Land area. There are no spaces for proper parking in the hospital land and it is creating more traffic congestion around Hospital junction. In order to provide more health-related facilities, (existing health related facilities Map 6.9)

- Proposed new zone as a health zone and provided regulations to encourage health related facilities and amenities in the zone.
- since the limited space in district general hospital the zoning factor supporting to high-rise buildings
- Proposing to Shift main vehicle entrance of hospital to the Sungawila road to Mitigate 50% of the Traffic congestion in the Hospital Junction.
- Provide Parking facilities for the People who visiting General Hospital with privet partnership.

- Improve the Bandaranayaka Mawatha and Nishshank3amalla Mawatha as two lane roads to minimise traffic at hospital junction by showing them as alternative routes to reach Pola junction



Map 6.9: Health institutions in Polonnaruwa

Source : UDA Polonnaruwa District office:

6.4.3.1.2 Education sector strategic plan

Considering the number of primary and secondary Educational facilities in Planning area, there are enough facilities to serve the threshold population in the present and also in future. But Royal central college is the only national level school in the area with all facilities for students of larger Catchment area. So that considering the conditions of most of the schools, need to be improved by recruiting teachers for number of vacancies in areas beyond the urban area.

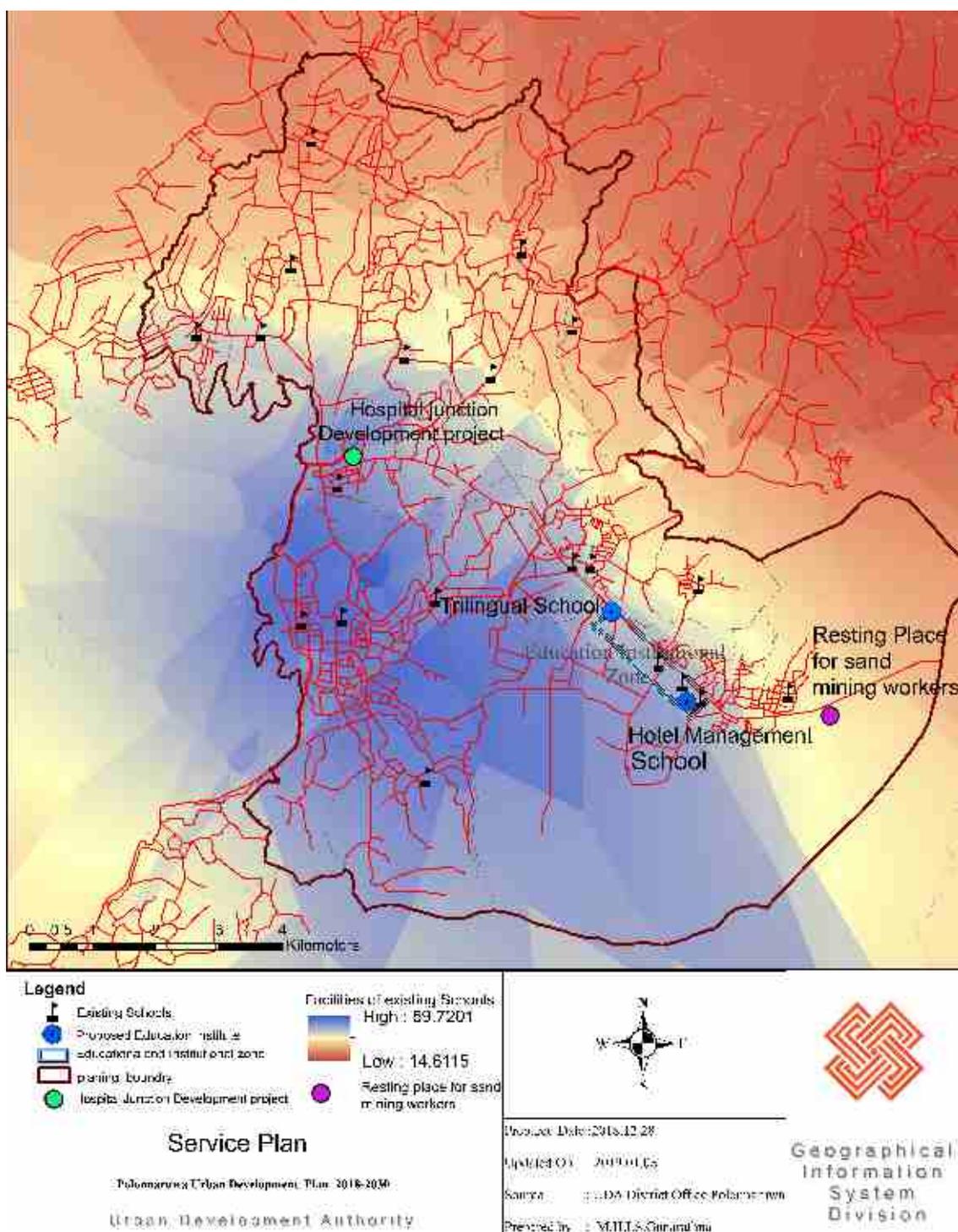
Trilingual school has been identified considering the ethnic group composition of Polonnaruwa. Most of Muslim schools and Tamil schools in Polonnaruwa are not facilitated well. So, this Trilingual school will give the opportunity to students of each and every ethnic group to study in a facilitated background. It indirectly makes the rest between ethnic groups in the city as well.

Considering the future need of hotel industry in Polonnaruwa, it is to be improved in to national level. Hotel Management School has proposed on the purpose of pushing unemployed young generation into the Hotel management industry which is currently not functioning parallels with national level.

Map 6.10 has shown facilitated level of existing schools. Only red patched areas having enough facilities for schools and there are number of schools showed using yellow patches are still needs to be improved by facilitating.

6.4.3.1.3 Mining sector service project

A Resting place for mining workers has identified considering the functionality of the Manampitiya and surrounding area with large scale of sand mining industry. Drivers and other labours have no proper place to rest and have food. So along with 2030 plan it has allocated the space for construct an adequately facilitated resting place for mining workers in Gallella.



Map 6.10 : Proposed service plan

Source: Polonnaruwa UDA District office

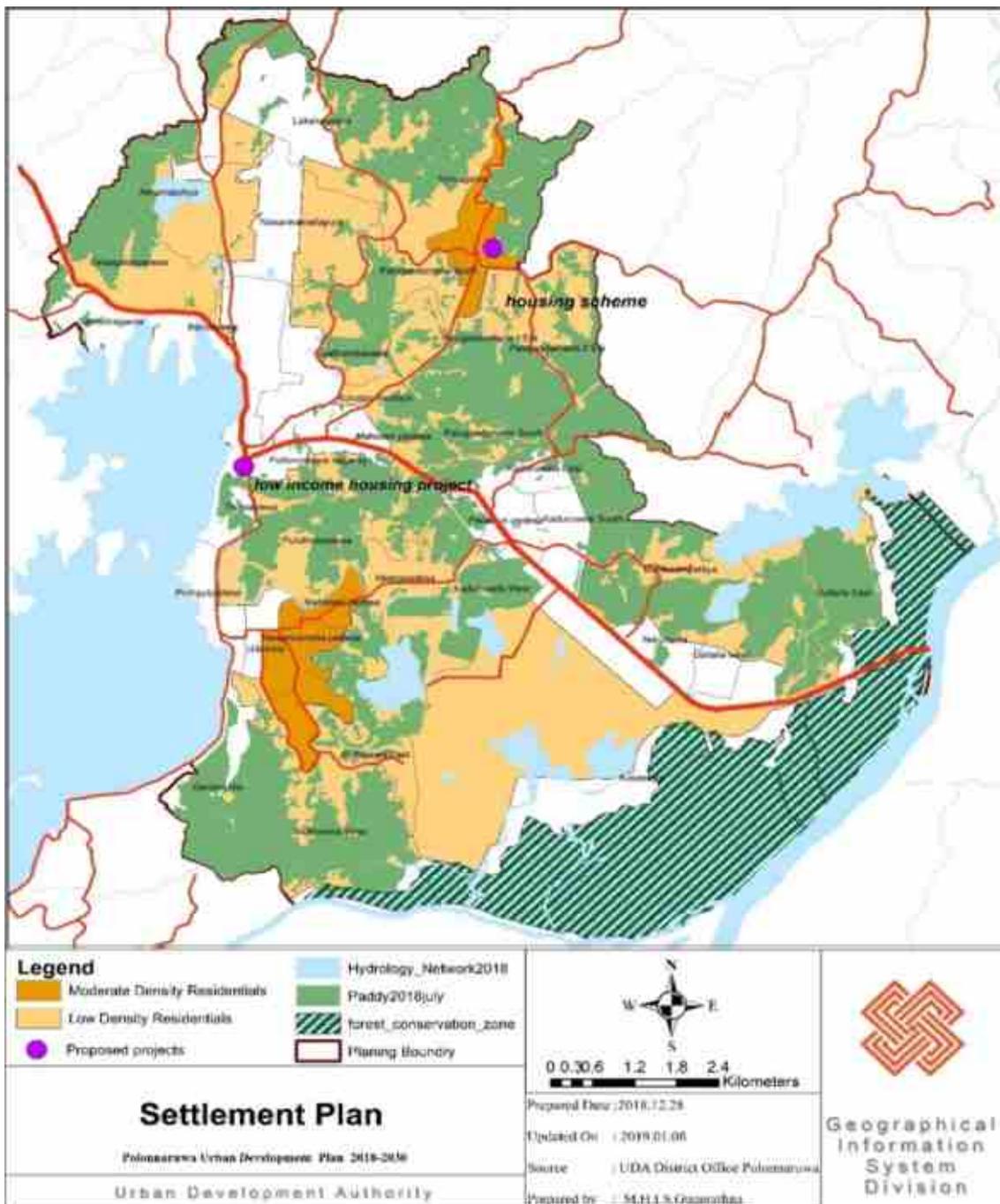
6.4.3.1.4 Housing sector service plan

When considering the housing sector of the area, 93% of total population has the ownership for their houses. According to the predicted population the housing demand for the year 2030 is 17090 with natural growth. As predictions If residential population became 100,000 in 2030 there will be 79010 housing unit's requirements in future.

The developable lands are limited due to number of paddy lands within the boundary limit.

In order to provide houses for the future demand, to fulfil the existing housing deficit and to address the pertaining issues, following strategies have been identified. (Map 6.11)

- A. Two separate zones have been identified considering the future intensity and Introduce the zoning factor
- B. Develop the infrastructure facilities in residential zone 1 to increase density.
- C. Clear the ownership of the lands
- D. Housing scheme at Sewagama
- E. Low income housing project near Pola junction



Map 6.11: Settlement plan

Source : UDA Polonnaruwa District office

6.4.3.2 Strategic Transportation Plan

According to the current situation of transportation in Polonnaruwa Planning area, there are 100,000 of commuters visit to the city per day and 15000 of vehicles running through the city per day. Consider the transportation pattern of Polonnaruwa planning area, there is high Traffic congestion along main arteries. Mostly at Peak hours such as 8am-9am, 12pm-2pm and 4pm-6pm it is getting more congested. On the other hand, improper bus stand needs to be more compatible to daily commuters. (Annexures 24)

Proposed Strategic Transport plan

The transportation plan has been prepared to improve the connectivity of three nodes, achieve comfortable living in the tropical environment, Tourism target infrastructure Development and to Optimum utilization of existing Infrastructure networks. Accordingly following strategies are formulated. (Map 6.12)

6.4.3.2.1 Introduce Bus circulation directly between Administrative city and commercial city (Map 6.12)

The road network of the area has developed by Pibidemu Polonnaruwa programme. But still the Kaduruwela and new town bus circulation of going via pola junction which takes more than 45 minutes. the direct bus route from Kaduruwela to Newtown via Swarna Jayanthi Mawatha will reduce time up to 15 minutes.

6.4.3.2.2 Development of Kaduruwela bus stand to facilitate daily commuters.

Current situation of Kaduruwela bus stand is, it is almost crumbled. Considering the number of daily commuters into the city, existing bus stand need to be repaired, modified and develop to facilitate daily commuters.

6.4.3.2.3 Install Directions boards and name boards within main junctions and sub nodes showing alternative routes and “where you are map”.

Installing direction boards at main junctions and sub nodes for improve the readability of the city. Polonnaruwa as a tourist destination, it is very important to make sure a clear idea about traveller's destination. So that direction boards instalment is proposed under 2030 urban development plan.

6.4.3.2.4 Improve connection between Kaduruwela bus stand and railway station

According to national physical plan 2050 the rail transportation will also have much development. The main railway station located in closer proximity to the bus station but totally separated. Improving interconnection between both will improve comfort level of commuters and tourist as well.

6.4.3.2.5 Improve sidewalks

- A. from sacred city up to Parakrama Samudraya bank along A11 road,
- B. from hospital junction area along A11 road and to Sungawila road 100m,
- C. within Kaduruwela city along A11 road
- D. new town administrative city roads

People tend to come to visit Polonnaruwa sacred city because of its uniqueness based the environment attached to heritage value. So, the physical surroundings and level of comfort which they expect should be rearrange by eradicating its uncomfortable level with hostile public transport and crappy sidewalks. Because those things will demotivate people to walk on the streets and feel the heritage city and also, they will try to use vehicles and it make more traffic congestion surround the heritage city

Not only tourists but also daily commuters who come to trade, commerce and other purposes also need to walk around Kaduruwela town to accomplish their day today works. Considering the number of commuters may come to the city in 2030 there should be enough space for pedestrians and make sure the walkability within the town area. Improving walkability may also attract other travellers who use A11 road to pass through Kaduruwela town.

Improvement of physical surroundings (Landscaping + tree planting) and level of comfort will lead people to walk instead of using vehicle and it will help to keep the sacred area clean air and less traffic congestion in a shady environment.

Bumps, broken pavement, obstacles (stray lamp posts), very narrow walkable sidewalks are common in Polonnaruwa. For most of us they represent a small annoyance, but for children, elderly, and especially people-with-disabilities, they are real barriers for getting around and feeling safe. In the long run, it will transform the city into a safer, healthier, more walkable, bikeable and a friendlier place to live for all walks of life.

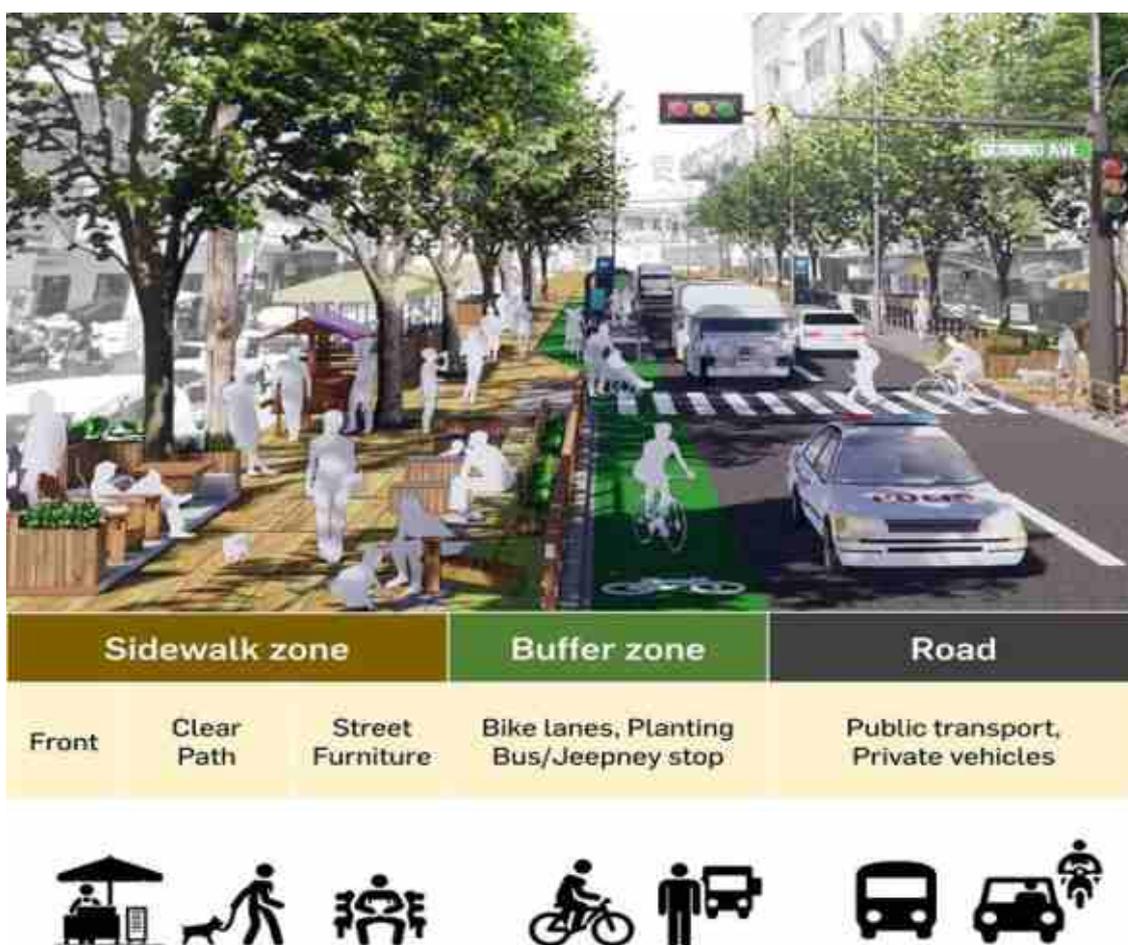


Figure 6.22 : Pedestrian Facilitating

Source: Siyudad PH fb Page

6.4.3.2.6 Kaduruwela Alternative road and three parking slots

According to the Polonnaruwa Development Plan 2030, Kaduruwela Town is the main commercial centre which attract number of commuters. Lack of parking facilities is the main bottleneck within Kaduruwela town which discourage daily commuters. As a solution for that, Polonnaruwa development plan 2030 has identified a reasonable location to provide and facilitate enough parking facilities as shown in map 6.12.

This alternative vehicle route is proposed from Kaduruwela church to CIB cloth shop. It is designed behind of the Kaduruwela city touching the periphery of paddy land as shown in the figure. There are three locations has proposed to develop as parking slots. The main purpose of this alternative road is to reduce traffic congestion at A11 road and open up it for pedestrians and commuters who are coming to Kaduruwela town for commerce and trade activities and for other services. Three slots of parking locations at this road will facilitate commuters to park their vehicles without having any hard circumstance. They only have to park their vehicle and walk into the town using ally road in between (Figure 6.22).



Figure 6.23 : Proposed Kaduruwela Alternative road and three parking slots

Source : Field Survey UDA District office Polonnaruwa

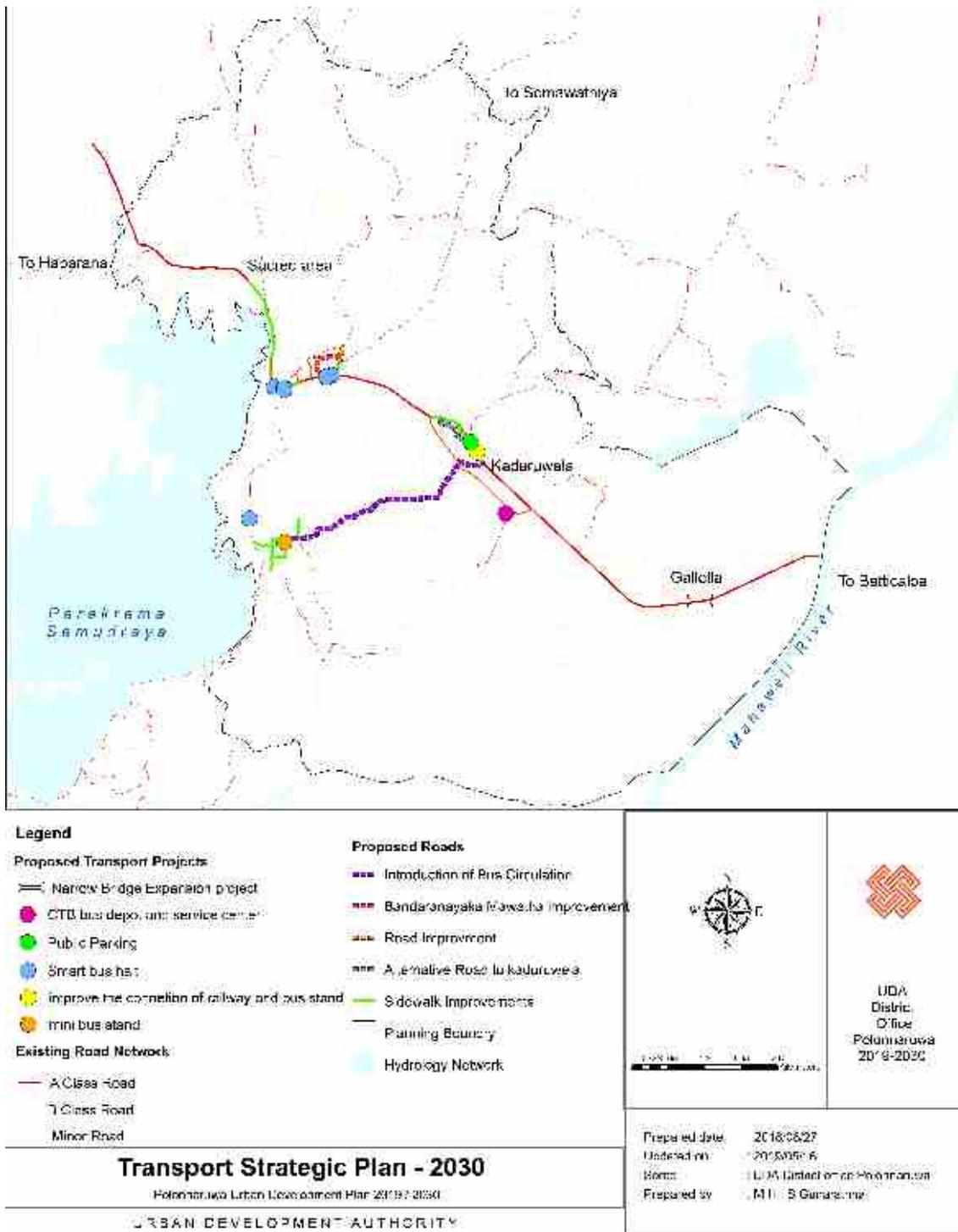
6.4.3.2.7 Widen up narrow bridge in Manampitiya

The narrow bridge near Gallella is obstructing to the smooth vehicle flow along A11 road (Figure 6.23). The bridge only has nearly 5m minimum width which is letting in only one long vehicle at once. So, it is a reason to increase the traffic congestion at peak times along A11 road. Considering accident records, there are considerable number of accidents has happened on this bridge mostly at night times too. In order to get rid of this situation, strategy has identified to widen up the bridge.



Figure 6.24 : Gallella Narrow Bridge

Source : Field Survey UDA District office Polonnaruwa



Map 6.12: Strategic Transport Plan
 Source: Polonnaruwa UDA District Office

6.4.3.3 Water supply Strategic Plan

Polonnaruwa district can be identify as an Agri base economic city. In terms of drinking water, the per capita water demand is 120 l per day. Industrial demand is 8% and commercial demand is 10% from domestic demand. According to water board reports, present Polonnaruwa district water demand is 80000m³ per day and from that 16100m³ for Thamankaduwa Ds division. If the target population of planning area reach 100,000 residential population the per capita demand per day of planning area will be 12000 m³.

For the sake of future demand for water in Polonnaruwa planning area, there are new water sumps has proposed by water supply and drainage board in Gallella, Sewagama and Bendiwewa. by implementing *Town east of Polonnaruwa water supply project* to provide drinking water, Gallella treatment plant will improve the capacity up to 12000m³ in 2030 which will cover the targeted demand. (Map 6.13)

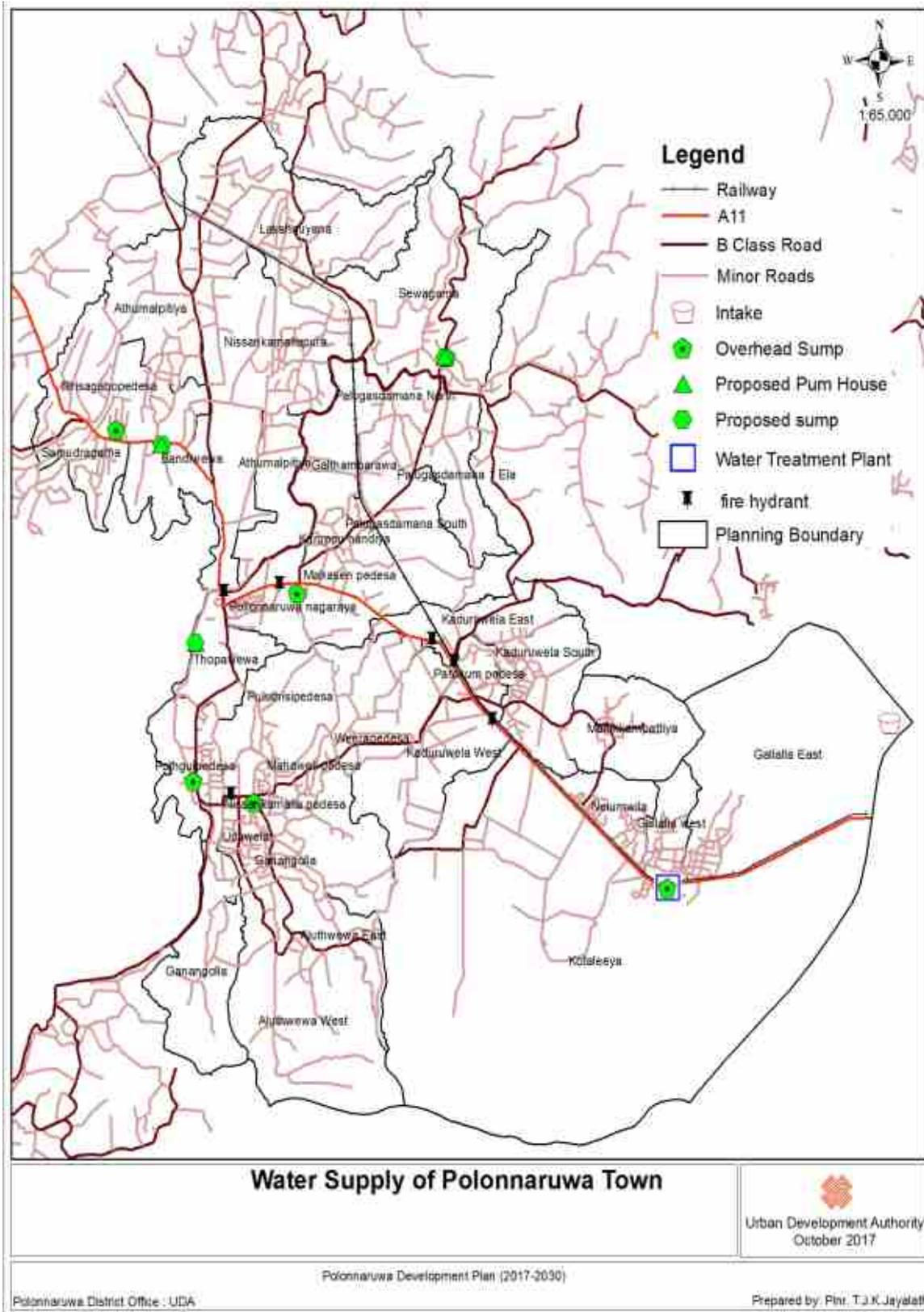
The irrigation requirement is fully covered with Parakrama Samudraya and the planning area has never suffered from lacking water for irrigation. The problems are related with irrigation channel network.

6.4.3.3.1 Improve the connectivity of irrigation canals by regulating maintenance and technical improvements.

It is proposed to improve the connectivity of irrigation cannels 100% in 2030. By removing the blocking areas of the existing hydrology network

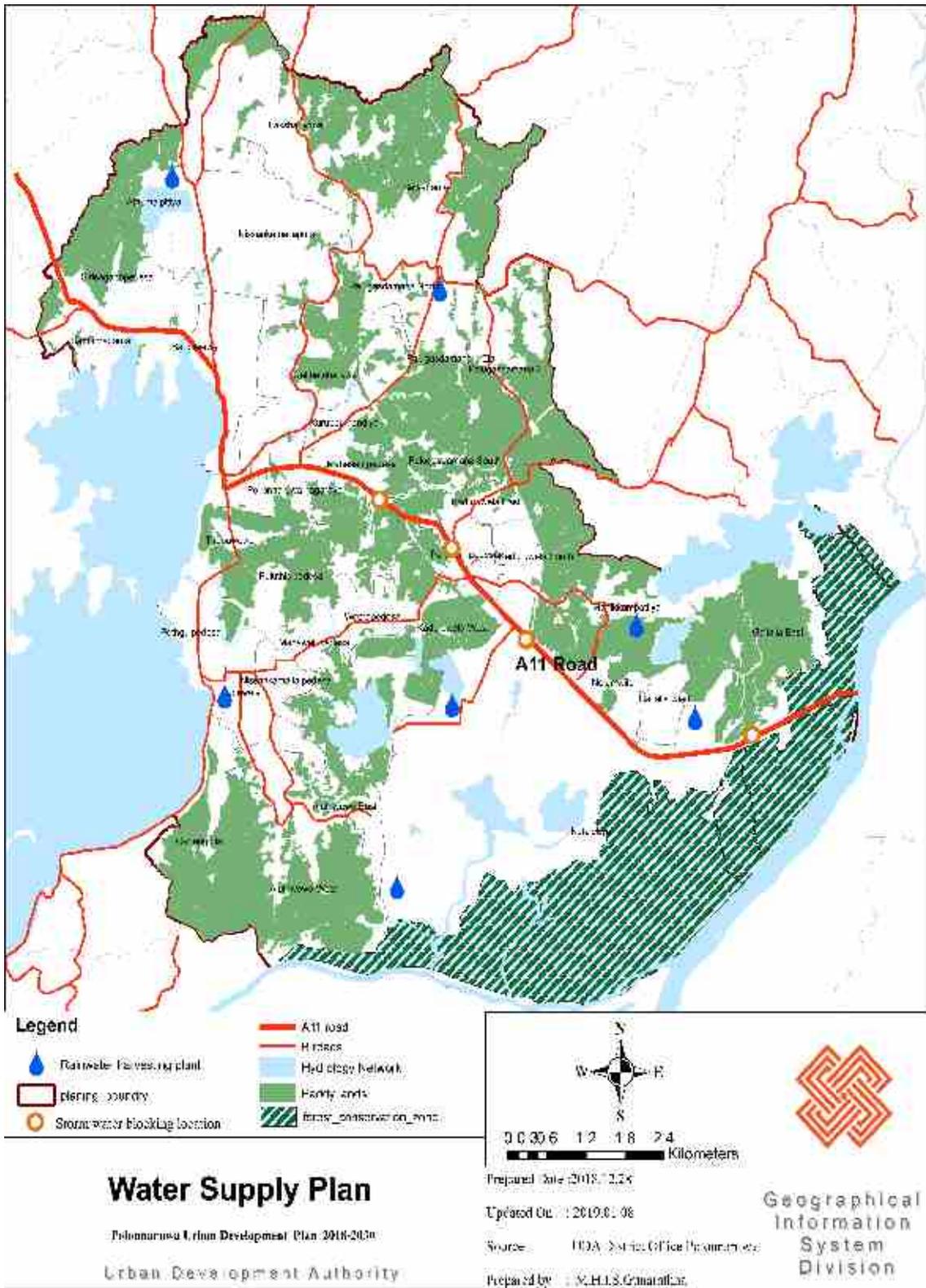
6.4.3.3.2 Motivate the community to proceed with rain water harvesting system.

Polonnaruwa development plan 2030 has identified places with large roofs to promote Rainwater harvesting system. This is also going to be practice within community level, by planning committees. community will be advised to keep maintaining a rainwater harvesting plant within their dwellings. The rain water harvesting plant will be providing from the local authority by adding extra charge for COC. (Map 6.14)



Map 6.13: Water Supply in Polonnaruwa planning area

source: UDA Polonnaruwa District office



Map 6.14: Water supply plan
 Source: UDA Polonnaruwa District office

6.4.3.4 Electricity and data lines

The electricity is provided by national grid of Sri Lanka. It has covered the entire planning area. So currently there is no any issue related to capacity except national issue in capacity in drought season. And the lines of the electricity supply laid in city will affect to the city beautification and safety of the people.

Accordingly following strategies have been formulated.

1. Encourage solar power system for individuals and compulsory for the government buildings through regulations.
 - Ex: More floor area for the person who are having green concepts in their building plan
 - reduction of 50 % processing fee by UDA at building application process

6.4.3.5 Strategic Plan for the Drainage and sewer line

As a city which is mainly depend on agriculture sector, it is a must to ensure the cleanness of the water when it reach to main water bodies of the area.

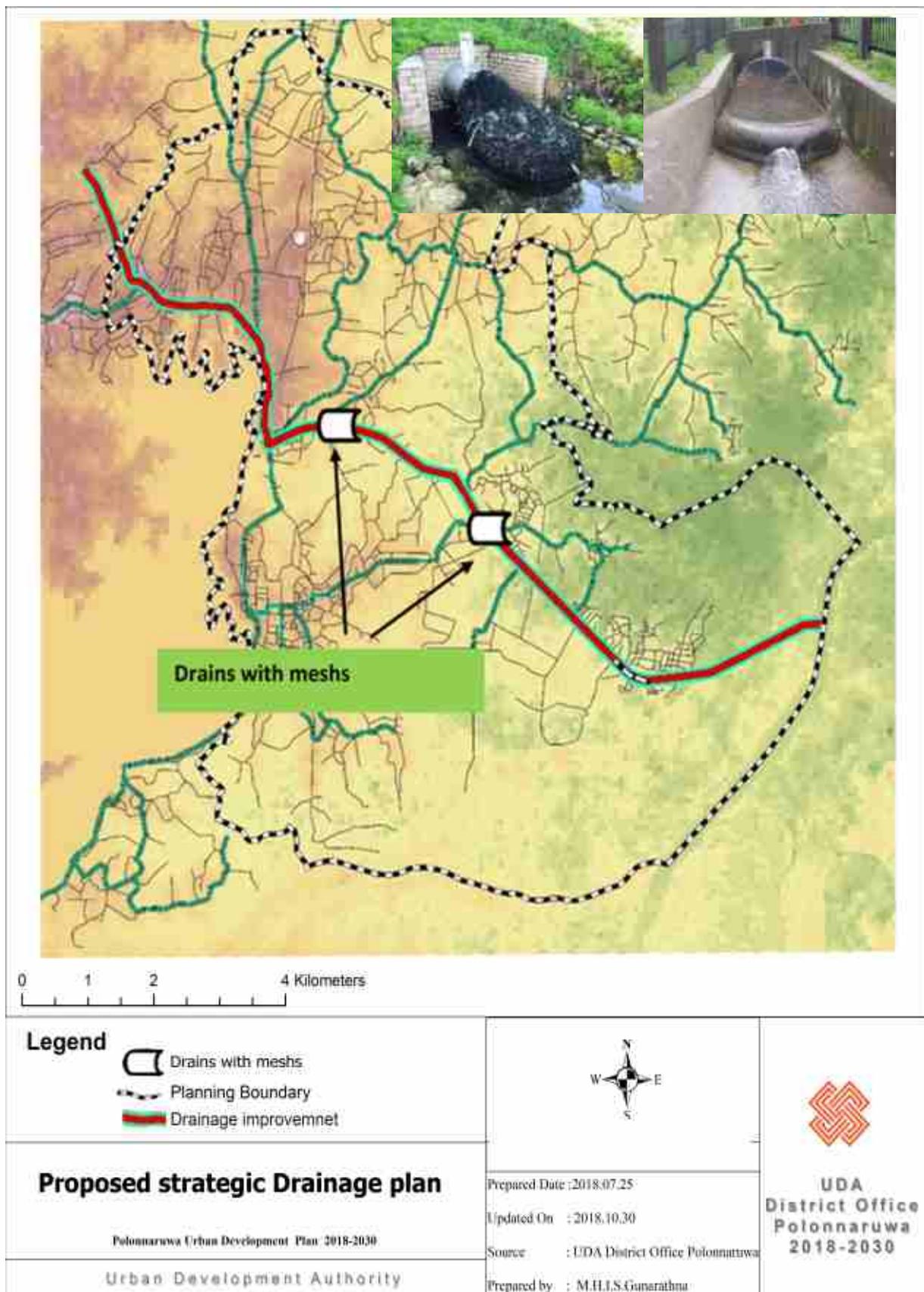
One of main problems in Polonnaruwa planning area is the improper drainage system. There is enough drainage capacity in Polonnaruwa planning area to carry on storm water of the area. (Map 6.15). Although the capacity is enough still there being obstructs within existing drain line especially around Kaduruwela and Polonnaruwa hospital junction.

Other thing is storm water of the city has mixed with waste water generated from Kaduruwela town due to unavailable waste water purification plant. Accordingly following strategies has been identified to minimise the issues related to the drainage system of the city (Map 6.15).

6.4.3.5.1 Preparation of drainage master plan and implementation

6.4.3.5.2 Waste water treatment plan and implementation

6.4.3.5.3 Install drainage meshes in selected locations in drainages



Map 6.15 : Drainage Strategic Plan
 Source: UDA Polonnaruwa District office

As a strategy for control the plastic and other polluting waste gather inside the drainages, Mesh can be use within existing drainage network, so that plastics and other polluting wastes do not reach to rivers and other water bodies. This method can be introduced within Kaduruwela area and hospital junction area to minimise obstacles of drainages in 2030. But the overall drainage master plan is required to proper to minimize future impact successfully.

6.4.3.6 Waste management Plan

There are 13 MT of waste generate from Polonnaruwa planning area per day. 12MT from town and 1MT from heritage city. Currently there is waste composting site at Gallella and functioning well. Although there is no much issues related to waste management in Polonnaruwa area by Considering the futuristic perspective with hospital waste and other,

1. need to improve the Gallella existing solid waste plant.

- Treatment plant need for 30000L capacity to toilet waste
- At least 18'* 70' more space requires for Compost yards

Other than that National level solid waste processing centre will be locating at Meegawewa in Medirigiriya. The planning area will serve through that in 2030. (Existing 13 tons, future 20 tons)

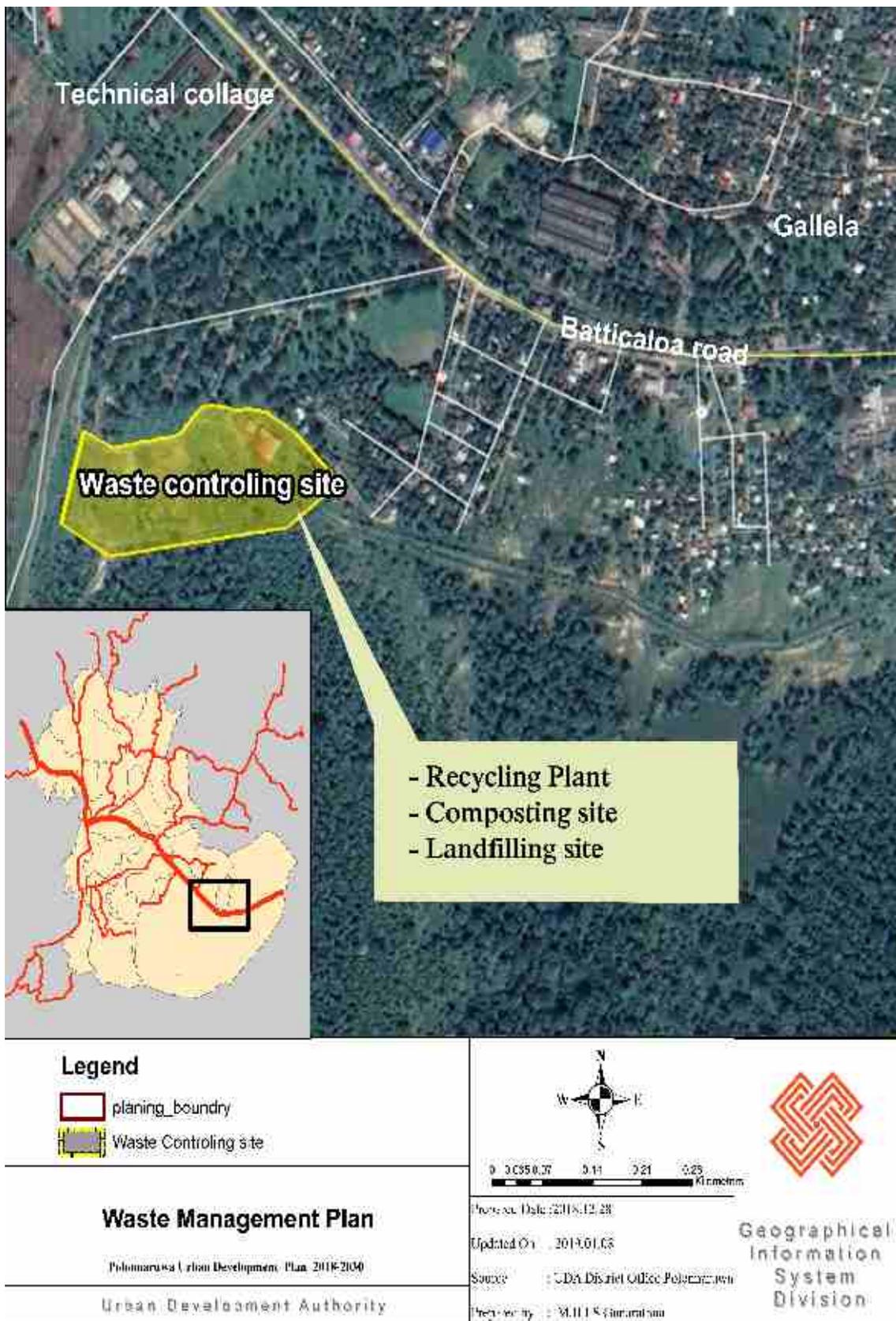
Polonnaruwa identified as agriculture-based district, people are so much familiar with compost fertilizers. As a strategic way to control biodegradable waste from the small house units, it will be very much healthier and suitable in futuristic perspective.

Accordingly following strategies have been identified through this plan to overcome aforesaid circumstances (Map 6.16)

2. Introduce the collecting points within the city limits.

3. Aware the people regarding the separation of waste as biodegradable and non-biodegradable.

4. Provide compost bins for each and every house and introduce a system to provide compost bins when obtaining the COC for the buildings to reduce the waste generation.



Map 6.16: waste treatment plant Gallela

Source : *Thamankaduwa Municipal Council annual report*

6.4.4 Environment Sustainable Strategies

Environment sustainable strategies have been formulated to Achieve comfortable living in the tropical environment, Preserve the sensitive areas & Identity, Protection of Historic elements of the area.

6.4.4.1 Conservation Plan

In order to protection of identity and improvement of tourism industry following areas needed to conserve. The zoning plan and zoning factor ensure the conservation of bellow said sites. The physical demarcation of boundaries will ensure it future.

A. Flood Plains National Park

Flood Plains National Park is one of the four national parks set aside under the Mahaweli River development project. The park was created on 7 August 1984. The park is central to the integrity of the Mahaweli system of protected areas, both for its unique “villus” and as a corridor for wildlife migration between grazing lands in Wasgamuwa and Somawathiya National Park. The area spans the Mahaweli Ganga in Polonnaruwa district in North Central Province. The township of Manampitiya lies just outside the eastern boundary of the park, a stopover in the Batticaloa-Polonnaruwa road and on the railway, which pass through the park.

B. Marsh areas and natural environment

Marshes have been identified in surrounded area of Parakrama Samudraya and near “Flood Plains National Park”. Apart from that natural forest cover proposed to be conserved when doing development projects

C. Paddy fields and abundant paddy fields

Paddy lands & abundant paddy lands in the Polonnaruwa Urban area should be conserved as flood retention and detention areas to mitigate flood hazards. And also, paddy lands are the one of the main economic drivers in Polonnaruwa Urban area.

To conserve and promote the paddy cultivation of the area, there is a separate zone identified as residential zone 2 which is include all the paddy lands and abundant paddy lands in it. This zone has special regulation to conserve all the paddy lands when doing relevant developments in the zone.

D. Ancient ruins

Archaeological monuments are representing the identity of Ancient Polonnaruwa city. So, in the conservation plan it has identified to conserve those ruins and monuments. It is proposed to mark physical boundaries to control encroachments.

E. Water Bodies

Polonnaruwa as one of main city consist with number of water bodies from antient eras. Water bodies of Polonnaruwa city is another identity of the city which need to be conserved for the sake of tourist industry and also for the sake of agriculture sector. Marking physical boundaries is proposed around water bodies considering buffer distance for each type of water body (lakes, tanks, canals, reservoirs). This will also indirectly minimize mixing toxic and garbage into water bodies too. Also, it is proposed to put warning boards to inform about drowning locations nearby water bodies where necessary.

6.4.4.2 Landscape Management Plan

Landscape plan is formulated to enhance the city beautification, to control the heat of the city, to minimise the carbon emission, to enhance the quality of life by improving the physical and mentality of the citizen. Based on that following strategies have been formulated to enhance the environment of the area.

6.4.4.2.1 Reduce the heat emission of the city through

- A. Road greening by shading a building and its outdoor spaces, vegetation cover at the building frontage, (figure 6.25,6.26,6.27)

There are two main roads have selected for tree plantation along the middle of the road and beside the roads.

- A11 road (from Hathamuna junction to Gallella NLDB)
- Maithripala Sirisena Mawatha

This strategy will lead to reduce the heat of the city and enhance the city beautification. Below are the names of trees that are proposed to plant along the aforesaid roads.

- ✓ Kaduruwela mosque
- ✓ New Homes Place shop
- ✓ Near HNB building
- ✓ Near CIB shopping center



Figure 6.25 : Tree plantation middle of the road

Source :Random Collection From Internet



Figure 6.26 : vegetation cover at the outdoor space and building

Source :Random Collection From Internet



Figure 6.27: vegetation cover at the roof top

Source :Random Collection From Internet



Figure 6.28: vegetation cover at the building frontage

Source :Random Collection From Internet

B. Clearing the wind path

In order to reduce the heat of Kaduruwela town area, it is proposed to open up four alley ways from paddy fields to the town area. Such as;



Figure 6.29 : four alleyways paddy's to All road

Source :Field Survey

6.4.4.3 Public Open Space Plan

According to the accepted standards of Urban Development Authority, open spaces have to be provided at the rate of 1.4 hectares per 1000 persons. According to the data analysis of the development plan it has forecasted that the population would be 100,000 by the year 2030. According to that it should be reserved 140 hectares as Public Outdoor Recreation in 2030.

6.4.4.3.1 Details of the Existing Public Parks & Playgrounds in Polonnaruwa Urban Area

There are 19.3 ha of Parks & Playgrounds of the whole Polonnaruwa Urban Area They have been categorized in Table 6.2 & Annexure 25

with UDA Public Outdoor Recreational Space.

No	Type of Parks	Extent (ha)
1.	Pocket Parks	0.3
2.	Mini Parks	5.4
3.	Local Parks	5.2
4.	Central Urban Park	8.4
	Total	19.3

Table 6.2: Existing PORS – 2018

Source Landscape Existing port Polonnaruwa

6.4.4.3.2 Strategies for development of recreational spaces / open spaces

6.4.4.3.2.1 Redevelop Existing Parks & Playground

Existing Parks & Playgrounds should be redeveloped according to the proper Landscape Plan under guidance with qualified persons.

6.4.4.3.2.2 Develop Linear Parks Concept

All the Ela, Parakrama Samudraya reservations should be developed as Linear parks and it helps to promote outdoor recreation facilities among the population.

6.4.4.3.2.3 Conserve the Flood Retention & Detention and Paddy Cultivation Areas

This plan suggested reserving the existing paddy fields, abounded paddy fields as flood retention & detention areas according to the flood hazards of the area. Development activities of the adjacent areas must be done in compliance to the relevant laws & regulations under the recommendations of relevant institutes.

6.4.4.4 Prepare Public Outdoor Recreational Space (PORS) Plan in 2030

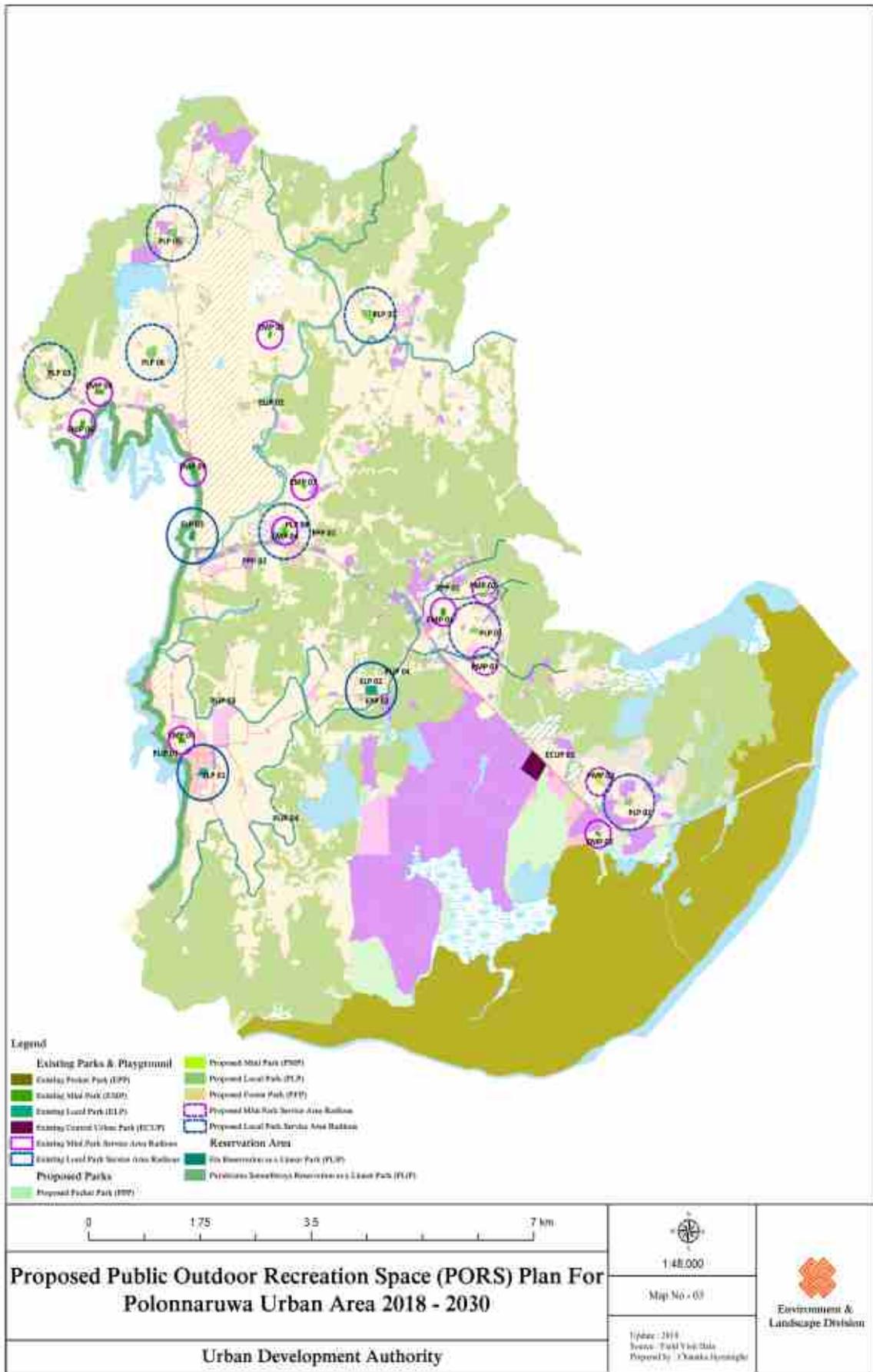
According to the forecasting population for year 2030 land requirement for the PORS for the Polonnaruwa Urban area for year 2030 is approximately 140. ha (Table 6.3 / Annexure 17/ Map No:6.13).

Under the Public Outdoor Recreational Space (PORS) Plan in 2030 following main parks identified to develop.

A. Public Square pola junction,

Table No 6.3: Proposed Public Outdoor Recreation Space Plan 2018 – 2030

No	Type of Parks	Allocated area (ha)	Permitted Uses	Minimum Plot size
1.	Proposed Pocket Parks	0.3	<ul style="list-style-type: none"> - Scattered play spaces - Rest areas - Garden patches 	- 0.5 acre
2.	Proposed Mini Parks	1.2	<ul style="list-style-type: none"> - Children's play area - Small grassed playground - Linear wood land Park - Rest garden 	- 0.5- 2.5 A
3.	Proposed Local Parks	13.8	<ul style="list-style-type: none"> - Football pitch combined with Children Play area and informal relaxation space - Large informal grassed area with Children play area - Small Woodland Park and an informal running practice area 	- 2.5 – 7.5
4.	Proposed Linear Parks	222.4	<ul style="list-style-type: none"> - Walking - Jogging - Cycling - Nature trails 	
5.	Proposed Forest Park	1513.5	<ul style="list-style-type: none"> - Information Centre - Nature trails - Canopy & walkways - Camping (Limited activities) - Research centres <p>Ela reservations * 1st Canal (Ela Reservation- 10m) 2nd Canal (Ela Reservation- 10m) 4th Canal (Ela Reservation- 10m)</p>	<ul style="list-style-type: none"> - Flood Plains National Park - Ela reservations*
5.				Total 1751.2
6.				Existing PORS 19.3
				Grand Total 1770.5



Map 6.17: Public Outdoor Recreational Space (PORS) Plan in 2030

A. Public Square

It is proposed to construct the public square in the identified land near Pola Junction as a Public Outdoor Recreational Space (Figure:6.29). This project is to be initiated under Pibidemu Polonnaruwa programme with the guidance and instructions of Polonnaruwa, Urban Development Authority. This Public Square will consist with number of features such as;

- children play area
- Aquarium
- Community hall
- Space for stalls
- Bus stand
- A bridge which is connect the lake and the public square
- A water wheel in channel for water suppling for the site



Figure6.30: Location map of the proposed public square

B. Kaduruwela Urban Park

Kaduruwela urban park is proposed with the aim of comforting the commuter population who come to both railway station and bus stand. This project was proposed considering one of main target of the 2030 plan which is to create a glorious city with a comforting and green environment.



Figure 6.31: Examples for urban park

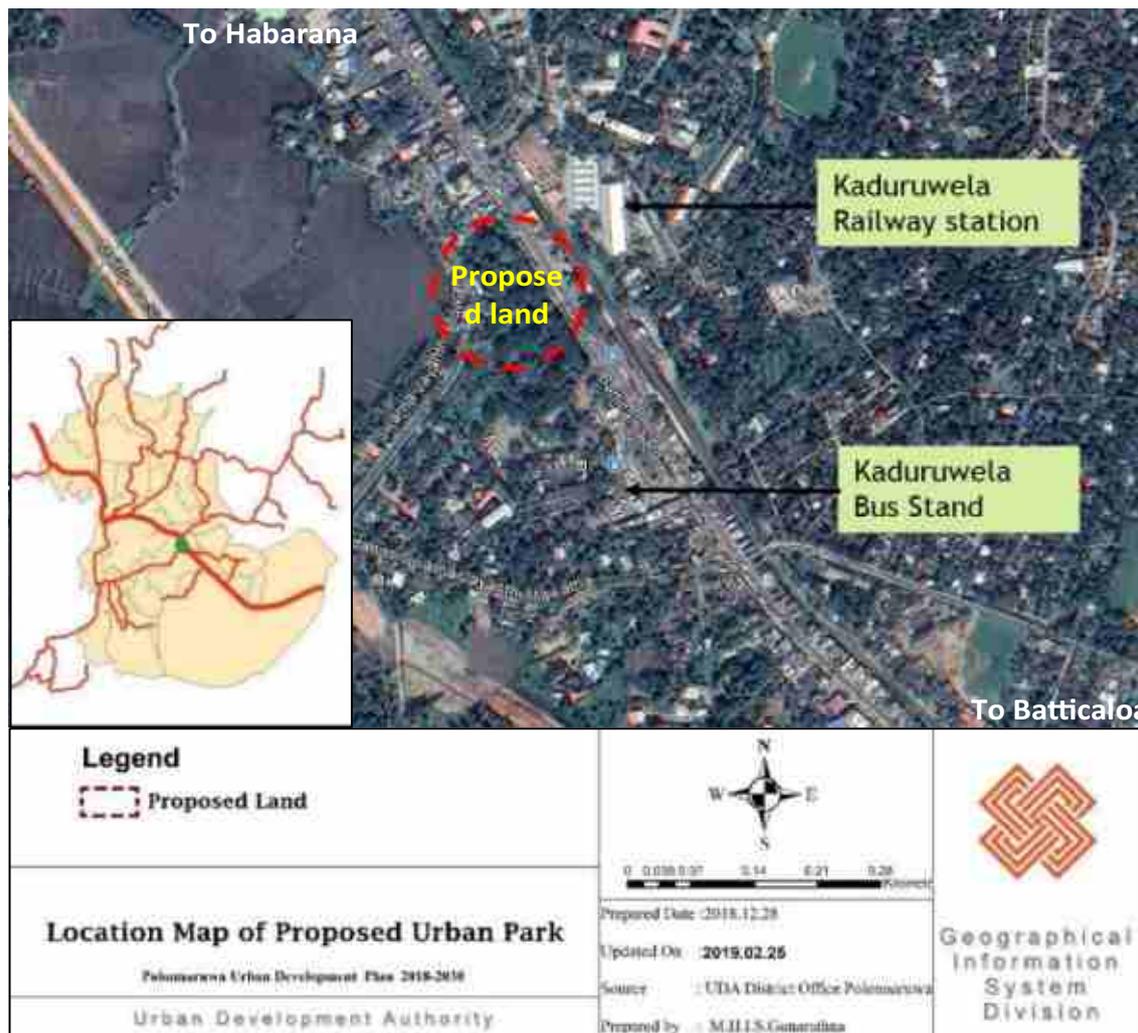


Figure 6.32 : Location map of Kaduruwela Urban park

C. Gallella Wetland park

Flood plain National park is an attractive location which is situated in Gallella when passing from Kaduruwela to Batticaloa by A11 road. Flood plain national park is rich with natural scenic beauty where having densified natural ecosystem consist with both wild life and natural environment. This is one of beautiful place in Polonnaruwa which have the attention of environmentalists but still have no exposure in order to get it contributed to enhance the city economy. Hence, 2030 development plan has proposed a wetland park with viewing decks while conserving its identical bio diversity and water bodies. This will be a different experience mainly for visitors who come to Polonnaruwa to feel the natural environment.

- ✓ Bird watching points and Elephant watching cart track
- ✓ Comfortable observation locations for feel the nature
- ✓ Boat riding facilities to observe aquatic life
- ✓ Summer hut

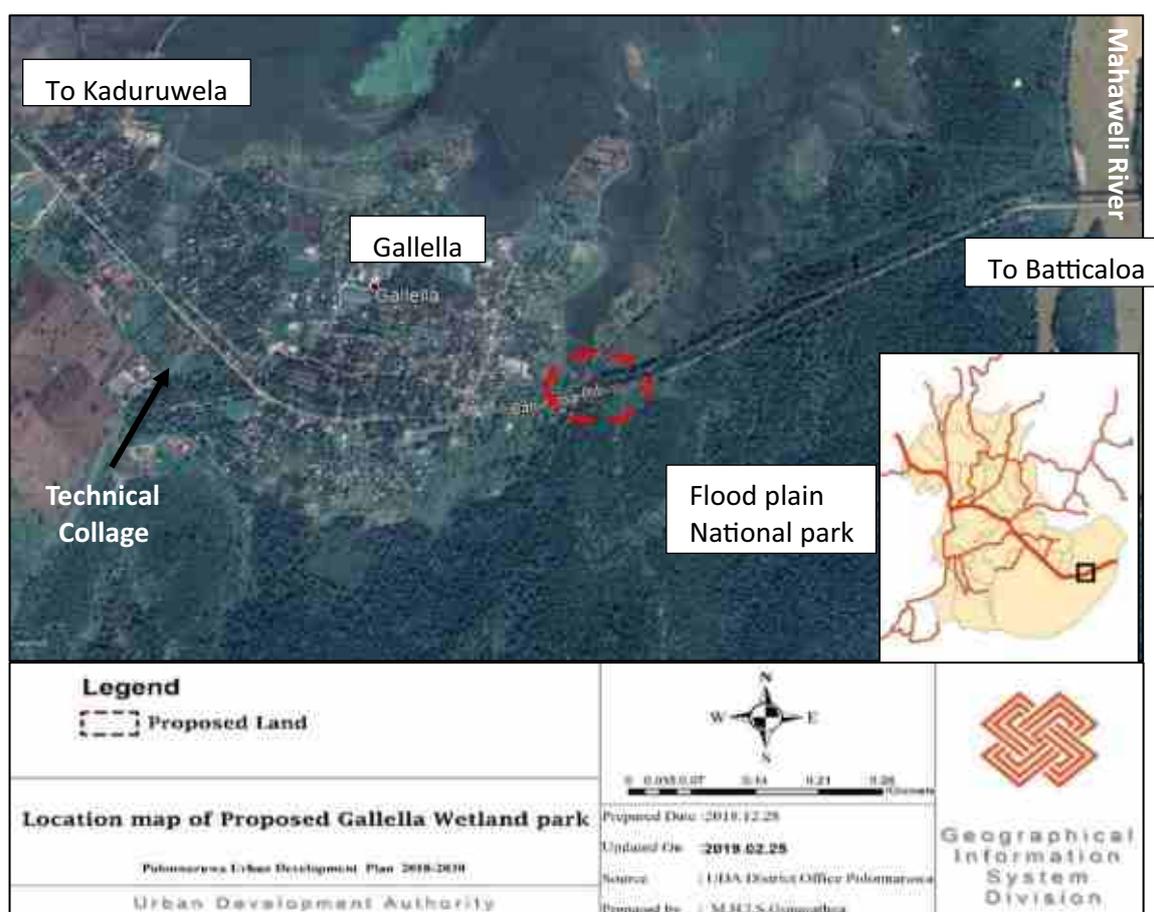


Figure 6.33 : Location map of proposed Wetland Park in Gallella



Figure 6.34: present name board of sanctuary



Figure 6.35: Beddagana Wetland park walkways



Figure 6.36: boat travels in Mahawali river

D. Deepa Uyana extension

Deepa Uyana was one of the projects which has identified under 2015 urban development draft plan by Urban Development Authority and initiated under Pibidemu Polonnaruwa programme. 2030 urban development plan has identified extensions for Deepa uyana project in order to achieve its goals and objectives.



Figure 6.37 : Deepa uyana extension project - conceptual master plan

Source : UDA Polonnaruwa District office



Figure 6.38 : Deepa uyana extension project conceptual Section plan

6.4.4.5 Disaster Risk Management Plan

Polonnaruwa urban area comparatively less in disaster. The main disasters occurred in Polonnaruwa Urban Area are,

1. Lighting
2. Flood
3. Cyclone
4. Human – Elephant Conflict.

6.4.4.5.1 Guidelines for the disaster-prone areas in Polonnaruwa Urban Area

The guide line for the disaster mitigation has been prepared under the “**Planning Guidelines for Urban and Natural Disaster Mitigation**” prepared by Urban Development Authority, associated with Disaster Management Centre, and Ministry of Disaster Management in March 2003.

6.4.4.5.2 Lightning hazards

Guidelines for minimizing accidents in frequent and major areas of lightning strikes can be cited as follows

1. Installation of lightning conductors during construction
2. Promote to install underground cable System.
3. Accident areas should be fitted lightning-protection facility in all building.

6.4.4.5.3 Flood hazards

According to the flood situation in Polonnaruwa Urban area, its observed that it occurs once a year. 192 houses are affected by this disaster in 2017. But with Moragahakanda water reservoir development it has stopped flood by Mahawali river.

In terms for reducing the flash floods to be occurred in town area, it is proposed to

- 1.To improve river, channel River, Cannels can be deepened, widened or cleared of obstruction to improve it conveyance capacity to prevent flooding.
- 2.Prohibited of filling of paddy lands and marshy lands.
- 3.Prepare a proper rain water drainage system for the area.
- 4.prepare conservation plan for the Marshy land, paddy lands, Low lying areas and abundant paddy lands for flood detention and retention.
- 5.Declare the area for the reservations for Mahaweli ganga 60m and Amban Ganga30m.
- 6.Classification of the flood hazard area
 - High flood area – Minimum Plot size – 20P.
 - Low flood area – Minimum Plot size – 15P
- 7.Special permeable paving within the urban area It is proposed to use permeable paving when constructing roads within urban area.

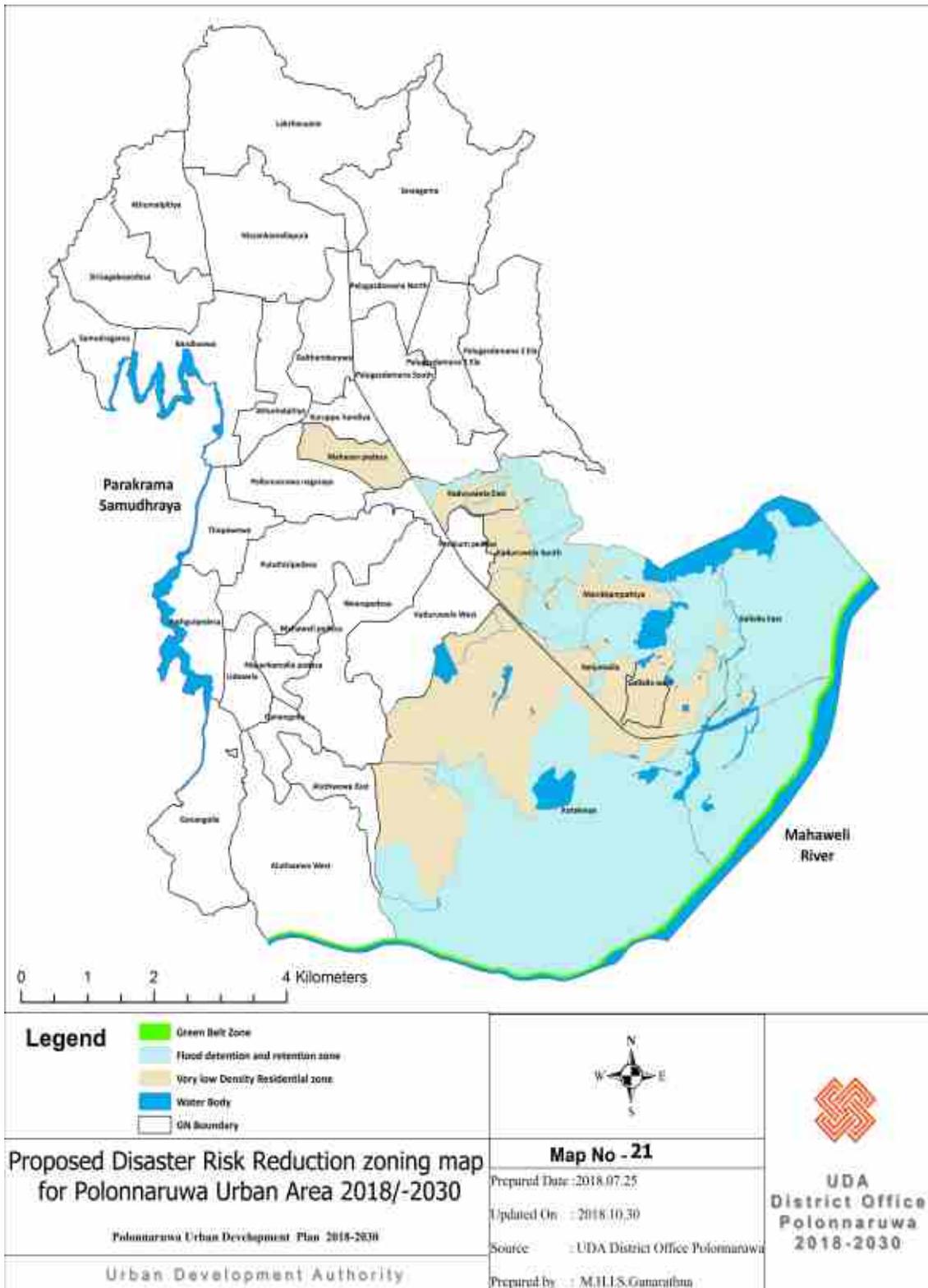
6.4.4.5.4 Cyclone

1. Propose to installed underground cable systems.3

6.4.4.5.5 The Human-elephant conflict

In order to minimize the impact of wild elephant corridors, following strategies have been identified to control the Human-elephant conflict.

1. Create a separation corridor by planting huge trees to obstruct their path.
2. Promote bee-culture along the elephant corridor
3. Lay a power line along the elephant corridor



Map 6.18: Proposed Disaster Risk Reduction Zoning
 Source: Environment and Landscape Division

6.4.4.6 Agriculture plan

Paddy is the main agriculture product in Polonnaruwa. It gives proportion of 15% of total national paddy production in Sri Lanka. Polonnaruwa is one of most suitable area for paddy cultivation considering its climate condition, soil type and also other environmental needs for paddy cultivations. Paddy cultivation is the main livelihood of inhabitants in Polonnaruwa from earlier age. Once agriculture became national income source, government focused on improving irrigation system for sake of paddy cultivation years back. Today there is a declining trend of paddy cultivation can be identified because of less attention on farmers and no any innovations to encourage them.

Vision of Polonnaruwa development plan 2018/2030 has elaborate the need of improvements and conversions of paddy cultivation in Polonnaruwa as it is one of main element of Polonnaruwa which is enhance the identity of the city and economy. Following strategies has identified in order to enhance and keep alive and active of paddy lands in Polonnaruwa. (map 6.19)

6.4.4.6.1 Conserve and Convert abandoned paddy lands for paddy cultivations

King Parakramabahu era, Polonnaruwa was a well bloomed city with paddy cultivation which supplied rice to entire country. But today, there is a declining trend of paddy industry which needs attention to be conserved.

Polonnaruwa planning area is having 3172.29501 hectares of paddy lands and 30.6849 hectares of abandoned paddy lands. Background study of the proves that comparing with previous years, abounded paddy lands are increasing so that there is a trend of converting paddy lands into other uses. So Polonnaruwa development plan have identified those abandoned paddy lands which are still suitable for convert back to paddy lands.

6.4.4.6.2 Training centre for farmers to keep them trained in new technologies and innovations in paddy cultivation

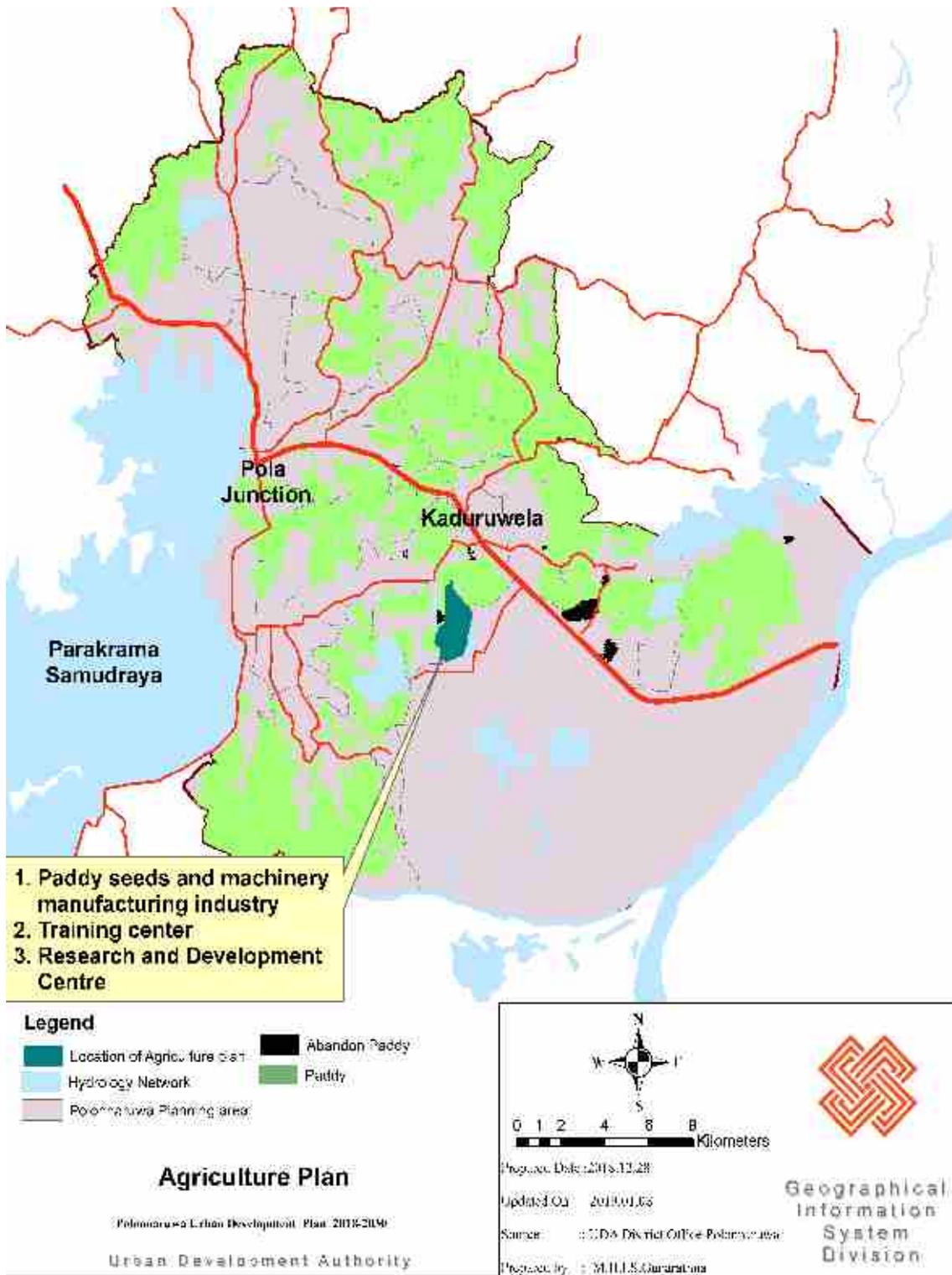
Main reason for decline paddy lands is conventional methods use in cultivations and also farmers are not getting satisfied solutions for their burning issues in cultivation. Farmers have to move on with global trends so responsible government servants have the responsibility to help farmers to expose with new technologies and methods in cultivating. Paddy seeds and machinery manufacturing industry, Training centre for farmers will give an effective environment for such changes.

6.4.4.6.3 Seed and Planting Material Research and Development Centre and machinery manufacturing industry

Seed and Planting Material Development Centre has proposed with the aim of Basic Seed Production and Distribution, Planting Materials Production & Distribution, Seed & Planting Material related Capacity Building and also practising soil fertility and its sustainability. Research and Development centre within the granary city itself will be the greatest opportunity for farmers and agriculture researchers. The people of the area will emerge employment opportunities for people in the city as well.

Paddy museum with spiritual village surrounding will Provide a conducive place for Spiritual activities for local and foreign visitors. It will also help to harmonize the natural beauty with human beings.

To harmonize the natural beauty with human beings has proposed to recall important turning points and highlights of the paddy industry throughout the time. It also includes models of conventional methods used in Paddy cultivation in the past (refer Agri tourism plan for more detail).



Map 6.19: Agriculture plan
 Source : UDA District office, Polonnaruwa

6.5 Linkages Between other strategies

The city required more income generation opportunities but having more sensitive areas and less developable lands. With untapped potentials such as paddy culture and irrigation as a heritage to the city created vision and goals. with SWOT analysis for each goal understood the objective to achieving 2030. Based on the created concept plan with many analyses such as Sensitivity, liveability and potentials. Finally, the Six base strategies identified to achieve above said targets in 2030.

The economic development strategy and heritage management strategy is the base and targeted improve the economy of the city using heritage and environment. Physical infrastructure development strategy addressed the provision of facilities, amenities and services to achieve economic targets as well as the comfortability for commuters and residents. Sustainable environment strategy promoted protection of sensitive areas and liveability in tropical climate. The physical development strategy created with zoning plan and regulation in zones in order to achieve all above discussed strategies. For example, the zoning plan promote infrastructure development in developable lands and reduced infrastructure provision in conservation zones. Implementing each and every action project related to above strategies will create “green glorious heritage city in kingdom of rise at year 2030.

6.6 Implementation Strategy

This is the most important strategy from all. Many action projects have been identified to implement in Polonnaruwa Development plan 2030 (Table 6.4). Accordingly, the projects have been arranged into a highchair order by considering following factors.

- Vision of the plan
- Interconnection of projects
- Project benefits
- Environmental aspect
- Social aspect
- Project cost

Accordingly, the projects have been prioritised as follows.

- 1 First priority projects (Table 6.5)
- 2 Second priority projects (Table 6.6)
- 3 Third priority projects (Table 6.7)

Investment methods for implement those projects has been identified as,

1. Public capital investment
2. Private capital investment
3. Public and private capital investment

Project Priority list also has included continuation projects from Polonnaruwa draft development plan 2015. Below identified priority list has separately mentioned those action projects.

6.6.1 Strategic Action Projects

Table 6.4: Strategic Action Projects

	Action Project	Responsible institutes for Planning & implementation	Implementation Time period /years
1.	New Star class Hotels	UDA, SLTDB, CEA	5
2.	Preparation of stakeholder inventory and regularizing existing hotel	UDA, PMC	1
3.	Recreational and commercial Fishery and boating services	UDA, PMC, DI	2
4.	Dock less bike sharing programme through online system	CCF, PMC	2
5.	Natural aquarium and fresh water fishing village	UDA, DI, PMC	3
6.	Introduce an alternative tourism route to cover new tourist sites.	UDA, CCF	3
7.	Viewing Deck and Agri Tourism recreational activities	UDA, PMC	2
8.	Practice Japan's Paddy Art, at Kaduruwela paddy fields	UDA, PMC, Hotel Ramadha	2
9.	Irrigation museum with practical examples	UDA, DI,	3
10.	Paddy Museum and a model village	UDA, AD, PMC, PPS	3

11.	Introduce Rice retail & large-scale wholesale market in Kaduruwela town	UDA	2
12.	Implement a Trade & Commercial centre to market agriculture products	UDA,	3
13.	CTB Bus depot and distance travelling service centre	UDA, CTB, PMC	3
14.	land public fair and vehicle parking space (existing CTB bus depot land)	UDA, PMC	5
15.	Redevelopment of existing shops in the commercial belt with provision of sidewalks and greening	UDA, PMC, RDA	5
16.	Financial complex development for all financial institutes at Kaduruwela	UDA, privet public Banks	4
17.	Mini bus stand and shopping complex at new town	UDA, PMC	3
18.	Improvement of functions in tourism facility centre and include SMART banking units	UDA, privet public banks	1
19.	Shopping complex at CCF land for tourism related activities	UDA, CCF	1
20.	Mini bus stand and shopping area at in front of public squire	UDA, PMC,	3
21.	Public urban squire and restaurant area	UDA, PMC	3
22.	The UNESCO heritage city physical demarcation of boundary	UDA, Department of Archaeology	3
23.	Tank reservation demarcation	UDA, Department of Irrigation	3
24.	Boundary demarcation for “Wijithapura fortress /Kaduruwela balakotuwa”	UDA, Department of Archaeology	5
25.	Re Development of Existing Shops in Archaeological City	UDA, Department of Archaeology	3

26.	city entrance and nodal point development	UDA, Department of Archaeology, RDA	3
27.	Improve the infrastructure facilities in Heritage city. (night time and cycling friendly infrastructure)	UDA, Department of Archaeology	3
28.	Landscaping in heritage city (flowering trees either side of roads)	UDA, Department of Archaeology	2
29.	Hela bojun hala near sacred city (map 6.17)	UDA, agriculture department	2
30.	3D museum with historic library (including Kings statue, Present leaders, 3d technology)	UDA, Department of Archaeology, PMC	2
31.	Shift main vehicle entrance of general hospital to the Sungawila road	UDA, general hospital, RDA, PMC	5
32.	Provide Parking facilities for the People who visiting General Hospital with privet partnership.	UDA, general hospital, RDA, PMC	3
33.	Improve the Bandaranayaka Mawatha and Nishshankamalla Mawatha as two lane roads	UDA, general hospital, RDA, PMC	3
34.	Re – Location of RDHS Office	UDA, general hospital, RDA	2
35.	Hotel Management school	UDA, Tourism development board	3
36.	A Resting place for mining workers	UDA, PPS	3
37.	Trilingual school	UDA, Education department,	2
38.	Housing scheme at Sewagama	UDA, Department of housing, PPS	5
39.	Low income housing project near Pola junction	UDA, Thamankadus DS office, PMC	3
40.	Introduce Bus circulation directly between	UDA, SLTB	1

	Administrative city and commercial city		
41.	Development of Kaduruwela bus stand to facilitate daily commuters.	UDA, CTB, RDA	3
42.	Install Directions boards and name boards within main junctions and sub nodes showing alternative routes and “where you are map”.	UDA, PMC, PPS, RDA	2
43.	Improve connection between Kaduruwela bus stand and railway station	UDA, Railway department	3
44.	Improve sidewalks	UDA, RDA, PMC	5
45.	Kaduruwela Alternative road and three parking slots	UDA, PMC	5
46.	Widen up narrow bridge in Manampitiya	UDA, RDA	3
47.	Improve the connectivity of irrigation canals by regulating maintenance and technical improvements. (Map 6.8)	UDA, Department of irrigation	5
48.	Preparation of drainage master plan and implementation	UDA, PMC	5
49.	Waste water treatment plan and implementation	UDA, PMC, PPS	5
50.	Install drainage meshes in selected locations in drainages	UDA, PMC, PPS	2
51.	improve the Gallella existing solid waste plant.	UDA, PMC, PPS	2
52.	Construction of alleyways from alternative route to A11 road in Kaduruwela	UDA, PMC, RDA	3
53.	Public Square pola junction	UDA, PMC	5
54.	Kaduruwela Urban Park	UDA, PMC	5
55.	Gallella Wetland park	UDA, PMC, CEA, department of wildlife	5

56.	Deepa Uyana extension	UDA, PMC, department of Archaeology	2
57.	New town urban park	UDA, PMC	2
58.	Paddy seeds and machinery manufacturing industry	UDA, Department of agriculture	2
59.	Training centre for farmers	UDA, Department of agriculture	2
60.	Seed and Planting Material Research and Development Centre	UDA, Department of agriculture	2

6.6.1.1 First priority Projects

Table 6.5: First priority Projects

	Action Project	Responsible institutes for Planning & implementation
1.	Preparation of stakeholder inventory and regularizing existing hotel	UDA, PMC
2.	Preparation of drainage master plan and implementation	UDA, PMC
3.	Waste water treatment plan and implementation	UDA, PMC, PPS
4.	Install drainage meshes in selected locations in drainages	UDA, PMC, PPS
5.	Improve the connectivity of irrigation canals by regulating maintenance and technical improvements	UDA, Department of irrigation
6.	improve the Gallella existing solid waste plant.	UDA, PMC, PPS
7.	Introduce Bus circulation directly between Administrative city and commercial city	UDA, SLTB
8.	Viewing Deck and Agri Tourism recreational activities	UDA, PMC
9.	Shift main vehicle entrance of general hospital to the Sungawila road	UDA, general hospital, RDA, PMC
10.	Provide Parking facilities for the People who visiting General Hospital with privet partnership.	UDA, general hospital, RDA, PMC
11.	Improve the Bandaranayaka Mawatha and Nishshankamalla Mawatha as two lane roads	UDA, general hospital, RDA, PMC
12.	Kaduruwela Alternative road and three parking slots	UDA, PMC
13.	Paddy Museum and a model village	UDA, AD, PMC, PPS
14.	Irrigation museum with practical examples	UDA, DI,
15.	Practice Japan's Paddy Art, at Kaduruwela paddy fields	UDA, PMC, Hotel Ramadhan
16.	Dock less bike sharing programme through online system	CCF, PMC
17.	New Star class Hotels	UDA, SLTDB, CEA
18.	Recreational and commercial Fishery and boating services	UDA, PMC, DI

19.	Low income housing project near Pola junction	UDA, Thamankaduwa DS office, PMC
20.	Widen up narrow bridge in Manampitiya	UDA, RDA
21.	city entrance and nodal point development	UDA, Department of Archaeology, RDA
22.	Improve the infrastructure facilities in Heritage city. (night time and cycling friendly infrastructure)	UDA, Department of Archaeology
23.	Improvement of functions in tourism facility centre and include SMART banking units	UDA, private public banks
24.	CTB Bus depot and distance travelling service centre	UDA, CTB, PMC
25.	The UNESCO heritage city physical demarcation of boundary	UDA, Department of Archaeology
26.	Tank reservation demarcation	UDA, Department of Irrigation
27.	Boundary demarcation for “Wijithapura fortress /Kaduruwela balakotuwa”	UDA, Department of Archaeology
28.	Re Development of Existing Shops in Archaeological City	UDA, Department of Archaeology
29.	Landscaping in heritage city (flowering trees either side of roads)	UDA, Department of Archaeology
30.	3D museum with historic library (including Kings statue, Present leaders, 3d technology)	UDA, Department of Archaeology, PMC
31.	Hotel Management school	UDA, Tourism development board
32.	Development of Kaduruwela bus stand to facilitate daily commuters.	UDA, CTB, RDA
33.	Install Directions boards and name boards within main junctions and sub nodes showing alternative routes and “where you are map”.	UDA, PMC, PPS, RDA
34.	Improve sidewalks	UDA, RDA, PMC

6.6.1.2 Second priority Projects

Table 6.6: Second priority Projects

	Action Project	Responsible institutes for Planning & implementation
1.	Natural aquarium and fresh water fishing village	UDA, DI, PMC
2.	Introduce an alternative tourism route to cover new tourist sites.	UDA, CCF
3.	land public fair and vehicle parking space (existing CTB bus depot land)	UDA, PMC
4.	Redevelopment of existing shops in the commercial belt with provision of sidewalks and greening	UDA, PMC, RDA
5.	Financial complex development for all financial institutes at Kaduruwela	UDA, privet public Banks
6.	Mini bus stand and shopping complex at new town	UDA, PMC
7.	Shopping complex at CCF land for tourism related activities	UDA, CCF
8.	Mini bus stand and shopping area at in front of public squire	UDA, PMC,
9.	Public urban squire and restaurant area	UDA, PMC
10.	Hela bojun hala near sacred city (map 6.17)	UDA, agriculture department
11.	A Resting place for mining workers	UDA, PPS
12.	Low income housing project near Pola junction	UDA, Thamankaduwa DS office, PMC
13.	Improve connection between Kaduruwela bus stand and railway station	UDA, Railway department
14.	Public Square pola junction	UDA, PMC
15.	Kaduruwela Urban Park	UDA, PMC
16.	Gallella Wetland park	UDA, PMC, CEA, department of wildlife
17.	Deepa Uyana extension	UDA, PMC, department of Archaeology
18.	New town urban park	UDA, PMC

6.6.1.3 Third priority Projects

Table 6.7: Third priority Projects

	Action Project	Responsible institutes for Planning & implementation
1.	Introduce Rice retail & large-scale wholesale market in Kaduruwela town	UDA
2.	Implement a Trade & Commercial centre to market agriculture products	UDA,
3.	Re – Location of RDHS Office	UDA, general hospital, RDA
4.	Trilingual school	UDA, Education department,
5.	Housing scheme at Sewagama	UDA, Department of housing, PPS
6.	Paddy seeds and machinery manufacturing industry	UDA, Department of agriculture
7.	Training centre for farmers	UDA, Department of agriculture
8.	Seed and Planting Material Research and Development Centre	UDA, Department of agriculture

6.6.1.4 Few Strategic Action Projects with More Detail

Strategic Action project 01

01.	Project Name	Preparing a Resource Profile of all the stakeholders in the Tourism Industry and registering them with the Tourism Development Board.
02.	Objectives and relevance of the project	One of the main objectives of the Polonnaruwa Urban Development Plan is to build the economy of the city through tourism. Today, there are employment opportunities and different types of tourist hotels, lodges, etc. at various prices related to the tourism industry across the city. Also, creating this resource profile is the basic basis for gathering information on all aspects from the travel guide and formally standardizing those sectors.
03.	Project steps	<p>a) Collection and analysis of the following sections</p> <ul style="list-style-type: none"> • Hotel types (star class) and their facilities • Small lodges and their facilities • Home Based Tourism • Travel guides list and bio data • Details of supply of taxi and bicycle for tourism • Restaurants, Handicrafts, Textile Local Manufacturers etc. <p>b) Providing them with the information they need to train them to improve their knowledge.</p>

		<p>c) Direct them to obtain legal approvals and standards</p> <p>d) To encourage the general public and other sectors of the town to be aware of the tourism industry and maintain the collective standard of the city.</p>
04.	Rough estimate	01 million
05.	Financial plan	Public and:Private Enterprise
06.	Project Implementation and Maintenance	Sri Lanka Tourism Development Board, Polonnaruwa Municipal Council and Polonnaruwa Pradeshiya Sabha

Strategic Action project 02

01.	Project Name	Design and: Implementation of Major Rainwater Drainage System
02.	Objectives and relevance of the project :	The urban area of Polonnaruwa is a very steep plain. Although there are rain water drains on either side of the main road, the system is not functioning properly due to improper construction and many other issues. The entire drainage system is blocked due to the accumulation of sewage into the sewers and the improper disposal of waste water. It is essential to plan and restore the main rainwater drainage system to achieve the city's future vision.
03.	Location :	Existing rainwater drainage system 
04.	Land extent	: Road reservation of The entire urban area
05.	Rough estimate	10 million :
06.	Financial plan	Government:treasury or as a NGO project (These types of projects are funded by NGOs.)

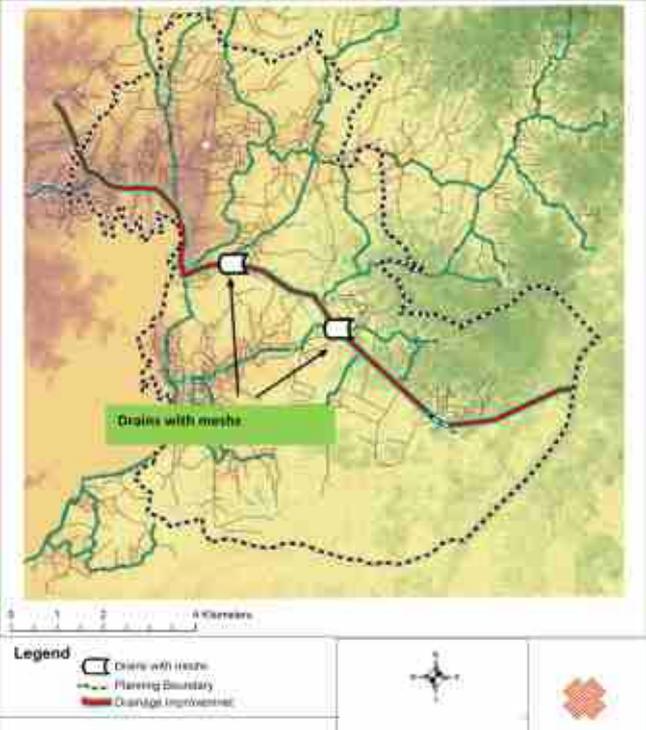
07.	Project Implementation	<ul style="list-style-type: none">• Urban Development Authority• Road development Authority• Polonnaruwa Municipal Council• Polonnaruwa Pradeshiya Sabha• Water Supply and Drainage Board
08	Maintenance	Polonnaruwa Municipal Council and Polonnaruwa Pradeshiya Sabha

Strategic Action project 03

1.	Project Name	Preparation and Implementation of Master waste water Drainage Plan and treatment plant
2.	Objectives and relevance of the project	Drainage of the city's wastewater into the city's irrigation system through rainwater drains Is a major problem at present. The water is then mixed with the paddy fields of the city and the farmers face many difficulties. Changing this situation is essential to achieving the city's future vision and goals.
3.	Location :	<p>Pola junction, Kaduruwela commercial city and New town are particularly important</p> 

4.	Project steps	<ol style="list-style-type: none"> 1. Installation of drainage system within the city's rainwater drainage system to carry waste water. 2. Release the water only to the pipeline by installing it in a filter system. 3. Making a mechanism to hand over Solid Waste Parts to their Solid Waste Management Unit. 4. Setting the pipeline along the natural slope and transporting it to the treatment plant at Manikkampattiya outside the city. 5. Distillation of purified water to the Mahaweli river through a pipe or canal.
6.	Land extent	Reserve on either side of the road, drainage system and final water treatment plant in Manikkam Patti area
7.	Rough estimate	15 million :
8.	Financial plan	NGOs, private enterprises
	Project Planning	<ul style="list-style-type: none"> • Urban Development Authority • Polonnaruwa Municipal Council • Water Supply and Drainage Board
9.	Project Implementation and Maintenance	<ul style="list-style-type: none"> • Polonnaruwa Municipal Council

Strategic Action project 04

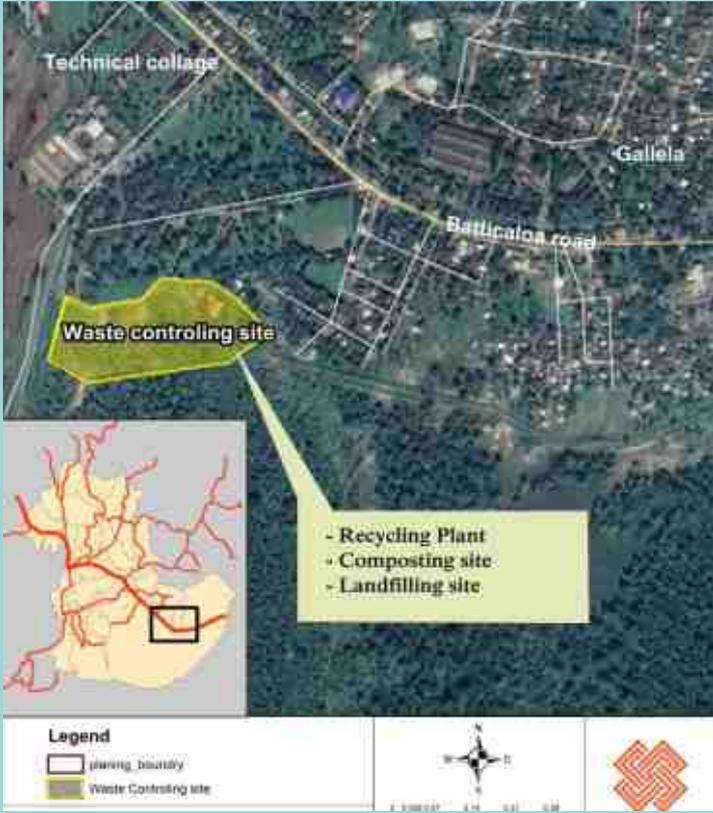
01.	Project Name	Installation of drainage nets at selected locations to retain solid waste in the rainwater system
02.	Objectives and relevance of the project	At present, both the city's rainwater and sewerage flows to the city's irrigation canals through the rainwater system. In addition to wastewater, a large amount of solid waste, such as plastic, polythene, glass bottles, is also deposited in the lowlands. It has been proposed to install these filter nets in several selected waterways in the city of Polonnaruwa until the drainage system is set up separately.
03.	Location :	
04.	Rough estimate	0.5 million :
05.	Financial plan	Polonnaruwa Municipal Council
06.	Project Planning	Department of Irrigation and Polonnaruwa Municipal Council
07.	Project Implementation and Maintenance	Polonnaruwa Municipal Council

Strategic Action project 05

01.	Project Name	Improving connectivity of irrigation canals by regulating maintenance and technical improvements
02.	Objectives and relevance of the project	A system of irrigation canals spread throughout the city. Although some major components of this irrigation canal have been fixed with concrete, more than 60% of them flow as normal canals. Nowadays various systems and unauthorized reclamation of land have broken the system. Therefore, even areas that were not submerged prior to an emergency rainfall are subject to flooding. To prevent this, the irrigation canal system must be thoroughly surveyed and restored.
	Location :	 <p>The map displays the geographical layout of Polonnaruwa, highlighting the irrigation canal network in light blue, major roads in red, and paddy fields in green. A legend in the bottom right corner identifies these features: Main Roads (red line), Irrigation Canal (light blue line), River and Tanks (dark blue area), and Paddy (green area). A scale bar indicates 4 Kilometers, and a north arrow is present in the top right corner.</p>
03.	Land extent	: The city's irrigation canal network and canal reserves

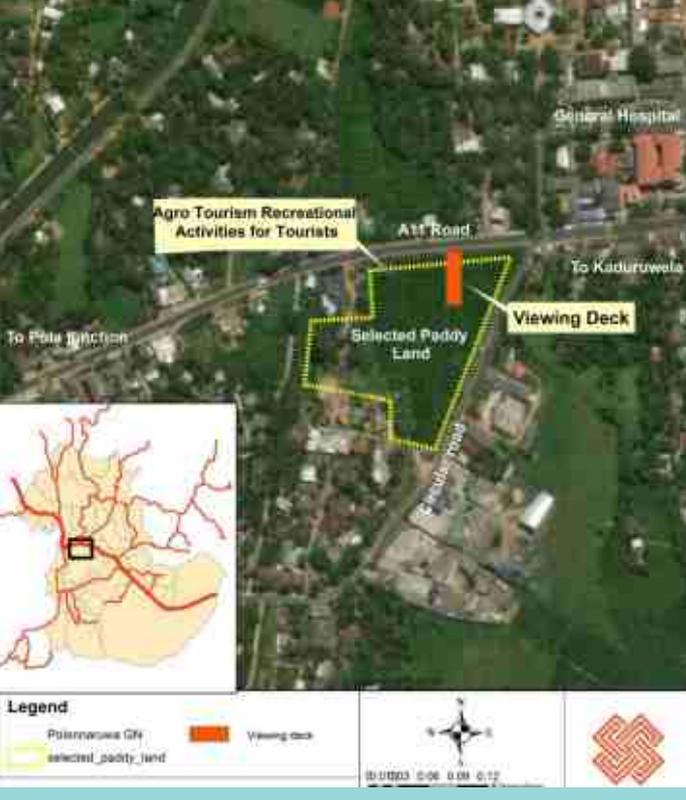
04.	Project steps	<ol style="list-style-type: none"> 1. 1. Identification of key stakeholders / farmers 2. 2. Cleaning of canal reserves 3. 3. Proper mapping of rainwater drainage system and canal system 4. 4. Identification of damaged areas and improving them 5. 5. Maintain the system properly.
05	Rough estimate	10 million
06.	Financial plan	<ul style="list-style-type: none"> • NGOs • Department of Irrigation • District Secretariat • Divisional secretariat office • Labor contribution of farmer organizations in the area
07.	Project Implementation	Department of Irrigation :
08.	Maintenance	Department of Irrigation and Farmers' Organizations

Strategic Action project 06

01.	Project Name	Improvement of Gallella Waste Management Center :
02.	Objectives and relevance of the project	The municipality has pointed out that the city collects 13 tons of solid waste daily. 48% of them are decaying and 52% are non-decaying waste. It is estimated that by 2030, the city will have 25 tons of solid waste daily, in line with the future population forecast. As a national level garbage management center has been proposed for the Medirigiriya Mee Geswewa area, it has been proposed to reorganize the existing Gallella garbage recycling center as follows.
03.	Location :	<p>Gallella Garbage Treatment Center (Map 6.16)</p> 
04.	Land extent	The land allotted to the garbage center is adequate
05.	Project steps	<ul style="list-style-type: none"> • 300 Refinery unit with 30000 liters capacity for

	/ items	sewage treatment : <ul style="list-style-type: none"> • 18 An 18x70 foot compost yard • Other machinery • Reconstruction of safe high tide elephant fences • Construction of a living fence around the premises • Construction of a separate building for the combustion unit
06.	Rough estimate	50 million:
07.	Project Implementation and Maintenance	Polonnaruwa Municipal Council, Polonnaruwa Pradeshiya Sabha

Strategic Action project 07

01.	Project Name	Paddy Viewing deck for tourist
02.	Objectives and relevance of the project	<p>It is essential to attract tourists through our paddy cultivation to become the best tourist heritage city in Sri Lanka. The first step is to take in the beauty of the green fields adjacent to the city's main road. Under the stimulus of beautifying one such project, the strategy was proposed to encourage other farmers to adapt their fields to the tourism industry and to adopt new ideas.</p> <p>It is expected to do so in conjunction with the Ranketha Hotel and other agro-tourism activities will be promoted here.</p>
03.	Location :	
04.	Land extent	4.5 acres (Ranketha paddy field)
05.	Rough estimate	The viewing platform is Rs. 01 million

06.	Financial plan	Private Investment and Polonnaruwa Municipal Council
07.	Project Implementation and Maintenance	Ranketha Hotel and Polonnaruwa Municipal Council

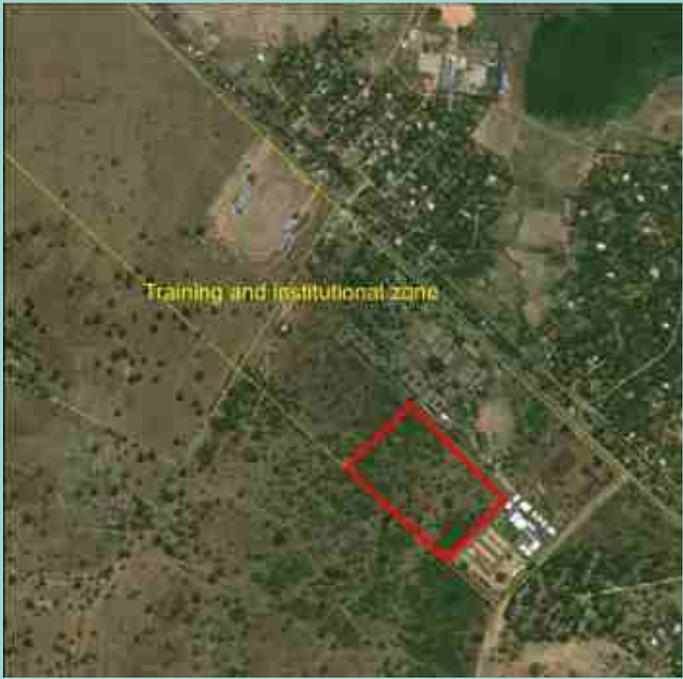
Strategic Action project 08

01.	Project Name	Relocation of the main vehicle entrance at the Polonnaruwa General Hospital to the Sungavila road
02.	Objectives and relevance of the project	The Polonnaruwa General Hospital area is about 22 acres but about 85% of the land is under construction. As such, there is insufficient parking space for the patients in the hospital premises. This is why vehicles entering the premises must immediately leave the premises. Traffic will be disrupted every 20 seconds as the main vehicle entrance and outpatient section are located along the A11 road and the main point of departure is near the main gate. In order to minimize this situation, the project proposes to transfer the main vehicle entrance and the patients to the existing entrance at Sungavila Road.
03.	Location	
04.	Land extent :	Premises near the entrance to the Sungavila road
05.	Rough estimate	50 million :
06.	Financial plan	Fund of Ministry of Health

07.	Project Implementation and Maintenance	General Hospital, Polonnaruwa
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Strategic Action project 09

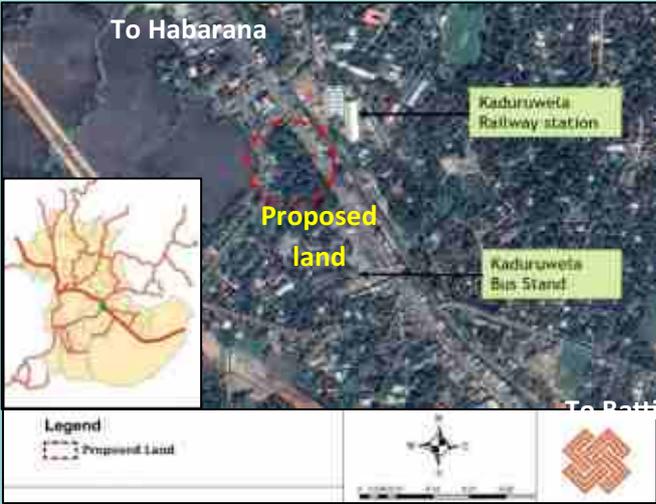
01.	Project Name	Hotel management school (Hotel Industry Development programme)
02.	Relevance of the project	<p>Considering the future need of hotel industry in Polonnaruwa, it is to be improved in to international level. Both local and foreign tourists used to leave the city as soon as they visit and entertained, but very rarely stay in the city for more than one day. The one reason for this is, there is no proper and standard accommodation facilities for serve them.</p> <p>This hotel management school will be a success way to improve hotel industry of the city in a standard way by training young people who are willing to enter to the industry regarding to tourism hospitality with new upcoming concepts. This will also be a great solution for 2.2% of unemployment population of the city.</p>
	Objectives	<ul style="list-style-type: none"> • Establish a new educational and vocational facilities • Facilitate the young generations for developing skills in hotel industry • Solution for unemployed population • Improve the quality of tourism industry • Distribute new knowledge among the younger generation

03.	Location :	
04.	Land extent	7 ha
06.	Rough estimate	40 Million :
07.	Project Implementation and Maintenance	Sri Lanka Tourism Development Board

Strategic Action project 10

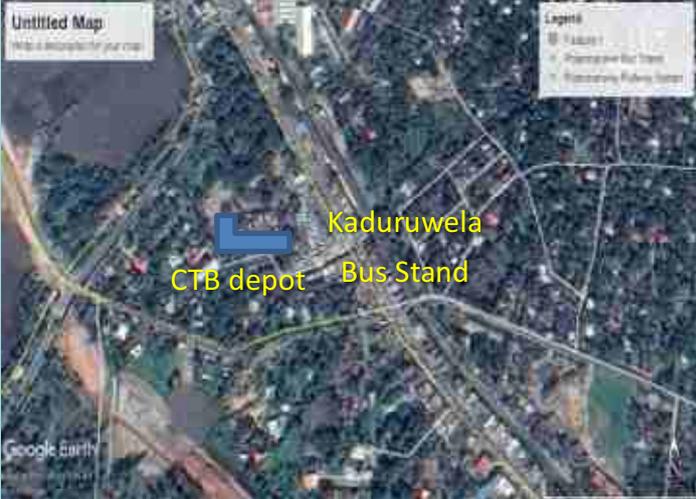
01. Project Name	Improvement to Tourism Information Centre :
02. Relevance of the project	<ul style="list-style-type: none"> • Provide Information for alternative travel plans within city for Tourists by display boards • Improve Tourist related shopping Arcade • Install SMART banking facilities within the premises
03. Location :	
04. Land extent	Same Land
05. Rough estimate	03 million:
06. Financial plan	Public and Privet partnership
07. Project Implementation and Maintenance	Public and Privet Banks Central cultural fund Polonnaruwa Municipal council

Strategic Action project 11

1.	Project Name	Proposed Financial Complex And Urban Park Kaduruwela
2.	Relevance of the project	The project has designed to facilitate high demand for financial complex in Kaduruwela while improve the livability and beauty of the city, Since The allocated land is the only available green space at Kaduruwela city center.
3.	Objectives	<ul style="list-style-type: none"> • Allocate lands for Government banks and Financial Institutions in Polonnaruwa, as per the requests. • Allocate green shady resting spaces for public at city center • Improve ventilation circulation within the city center • Reduce traffic at All road due to financial institutes. <p>Allocate spaces for vehicle parking at city center</p>
4.	Location :	
5.	Project steps	<p>a) Financial complex</p> <p>The land will be divided into 9 lots (25 perch) for</p>

		<p>financial institutes and 30-year leasing base. The common building will be design to small scale institutes in separate land by UDA. the institutes must follow the building guidelines by UDA made with a common theme for all. The idea is to achieve common landscape and improve Polonnaruwa identity.</p> <p style="text-align: center;">b) Kaduruwela urban park</p> <p>50 perch will be allocated for the open space and resting area. The park is proposed with the aim of comforting the commuter population who come to both railway station and bus stand and financial complex. This strategic project targeted the vision of the 2030 plan which is to create a glorious city with a comforting and green environment.</p> <p>The sild walk with common vehicle park will be design parallel to A11 road. Middle of the land will arrange the resting area with benches and urban furniture. The target is to save existing trees on site.</p>
6.	Land extent	2 Acers
7.	Rough estimate	<p>a) Financial complex : 30 million</p> <p>b) Kaduruwela urban park : 5 million</p>
8.	Financial plan	Public privet partnership
9.	Project Implementati on and Maintenance	<p>Urban Development authority</p> <p>Polonnaruwa Municipal council</p>

Strategic Action project 12

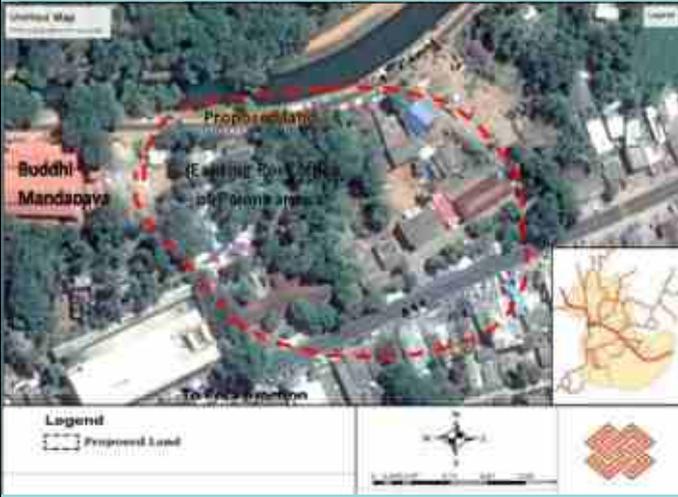
01.	Project Name	Public Market in Kaduruwela Bus Stand (Relocate CTB bus depot)
02.	Relevance of the project	Kaduruwela is the Commercial capital over 600,000 of threshold population of the district and surrounded area. At the moment it's seems that already it filled whole developable space covered from paddy area. Due to the demand in future the existing arrangement needed the rearrangement of the city centre. this project has identified to fulfil needs o f the area.
03.	Objectives	<ul style="list-style-type: none"> • Relocate CTB bus depot and improve the land efficiency • land will convert to two story building. • Ground floor will be dedicated to public fair to facilitate specially bus travellers. • The upstairs will function as vehicle parking space. • To Provide more organized space Commercial activities
	Location :	

	Project steps	1. Replace CTB but depot 2. Construct new building
04.	Land extent	1 Acer
05.	Rough estimate	08 Million:
06	Financial plan	Public privet partnership
07.	Project Implementation and Maintenance	Polonnaruwa Municipal Council

Strategic Action project 13

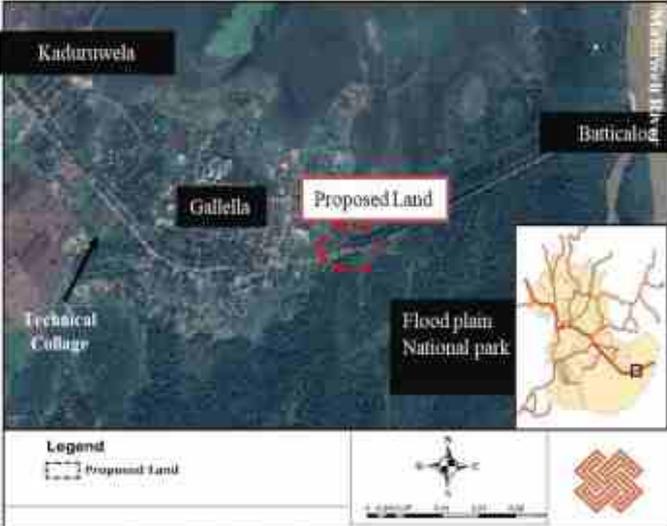
1.	Project Name	Mini bus stand and shopping complex At NewTown
2.	Relevance of the project	Since the new town functioning with whole administrative offices and district court and one national school at the centre there is a huge demand for a mini bus stand. The lawyers need more space for their officers. With considering demand, in front of the royal college entrance it has proposed mini bus stand with upstairs rooms for legal officers. The downstairs will have super market and communications and restaurant related shops.
3.	Location :	
4.	Project steps	<ul style="list-style-type: none"> a) Acquire land from Coconut Cultivation Board b) Design with landscaping c) Construction of the building
5.	Land extent	0.5 Ha
6.	Rough estimate	05 Million
7.	Financial plan	Public privet partnership
8.	Project Implementation and Maintenance	Polonnaruwa Municipal Council

Strategic Action project 14

1.	Project Name	Public urban square and restaurant area at Pola Junction
2.	Relevance of the project	It is proposed to construct the public square in the identified land near Pola Junction as a Public Outdoor Recreational Space (Figure: 6.29). This project is to be initiated under Pibidemu Polonnaruwa programme with the guidance and instructions of Polonnaruwa, Urban Development Authority.
3.	Location :	
4.	Project steps	<p>This Public Square will consist with number of features such as;</p> <ul style="list-style-type: none"> • children play area • Aquarium • Community hall • Space for stalls • Bus stand • A bridge which is connect the lake and the public square <p>A water wheel in channel for water supplying for the site</p>
5.	Land extent	2 Acer

6.	Rough estimate	5 Million :
7.	Financial plan	Public privet partnership
8.	Project Implementation and Maintenance	Polonnaruwa Municipal Council

Strategic Action project 15

1.	Project Name	Gallella Wetland park :
2.	Relevance of the project	Flood plain National park is an attractive location which is situated in Gallella when passing from Kaduruwela to Batticaloa by A11 road. Flood plain national park is rich with natural scenic beauty where having densified natural ecosystem consist with both wild life and natural environment. This is one of beautiful place in Polonnaruwa which have the attention of environmentalists but still have no exposure in order to get it contributed to enhance the city economy. Hence, 2030 development plan has proposed a wetland park with viewing decks while conserving its identical bio diversity and water bodies. This will be a different experience mainly for visitors who come to Polonnaruwa to feel the natural environment.
3.	Location :	
4.	Project items	<ul style="list-style-type: none"> • Bird watching points and Elephant watching cart track • Comfortable observation locations for feel the nature • Boat riding facilities to observe aquatic life • Summer hut

5.	Land extent	0.5 acre
6.	Rough estimate	4 million
7.	Financial plan	Public private partnership
8.	Project Implementation and Maintenance	Department of wildlife Polonnaruwa pradeshiya sabha

CHAPTER 7: ANNEXTURES



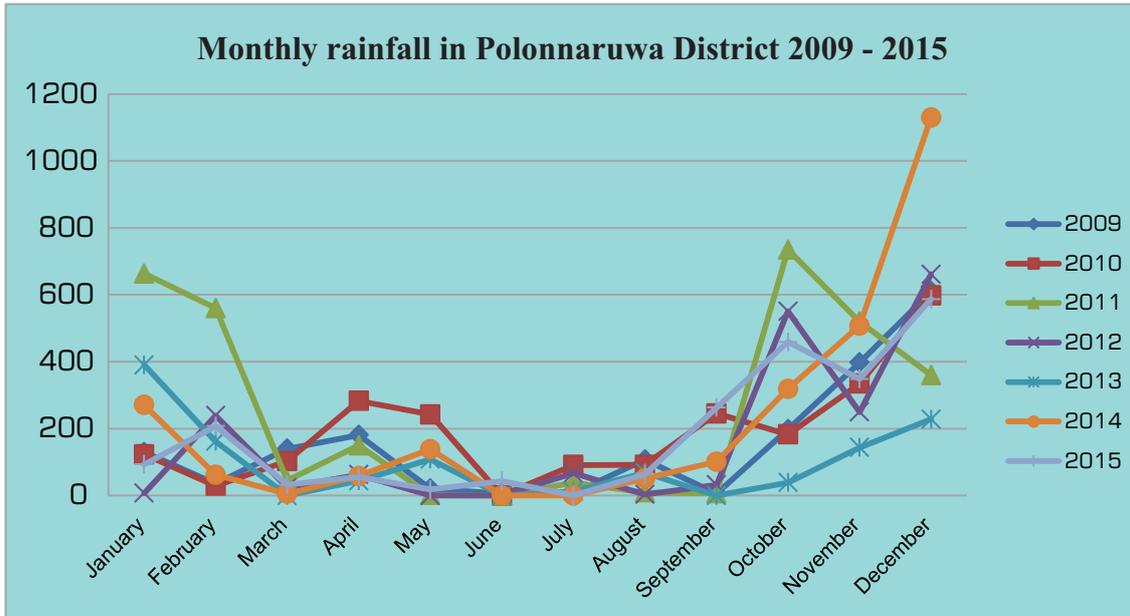
7. ANNEXTURES

Annexure 1: Approved Pibidemu Polonnaruwa Development projects 2017

	Type of Development	Approved Projects in 2017	Approved Amount in 2017 (LKR.M.)	Total Cost
1	School Development	88	600.00	382.37
2	Construction of Indoor Stadium in Royal Collage	1	146.62	71.48
3	Construction of Swimming pool in Ananda girls Collage	1	59.00	-
04	Piriven Development	11	150.00	44.81
05	Health (District Hospital Development)	16	700.00	140.65
06	Health (Polonnaruwa Kidney Hospital Development)	14	375.00	-
07	Supply of Drinking Water	34	1700.00	69.99
08	Urban Road Development (RDA)	9	2250.00	1700.82
09	District Road Development	36	1300.00	632.58
10	Rural Roads Development /Rural Roads Development (New Projects)	610	984.7	1594.70
11	Development of Livestock		12.00	11.02
12	Sports and Cultural	4	111.00	54.92
14	Disaster Management	270	100.00	8.14
15	Urban Development	6	1600.00	372.42
17	Religious Places Development	41	100.00	46
19	Installing accessories in theatres	4	200.00	119.05
20	Information Technology		5.00	-
21	Mahaweli Development	1	23.88	5.17
22	Irrigation Development	25	84.15	9.97
23	Agriculture development	2	100.00	0.06
24	Agrarian service	25	59.35	9.05
25	livelihood development	3266	600.00	7.95
26	wildlife reservation		4.00	
27	Small town Development		190.00	
28	Common Utilities	8	100.00	1.56
29	Administrative and management		5.00	3.97

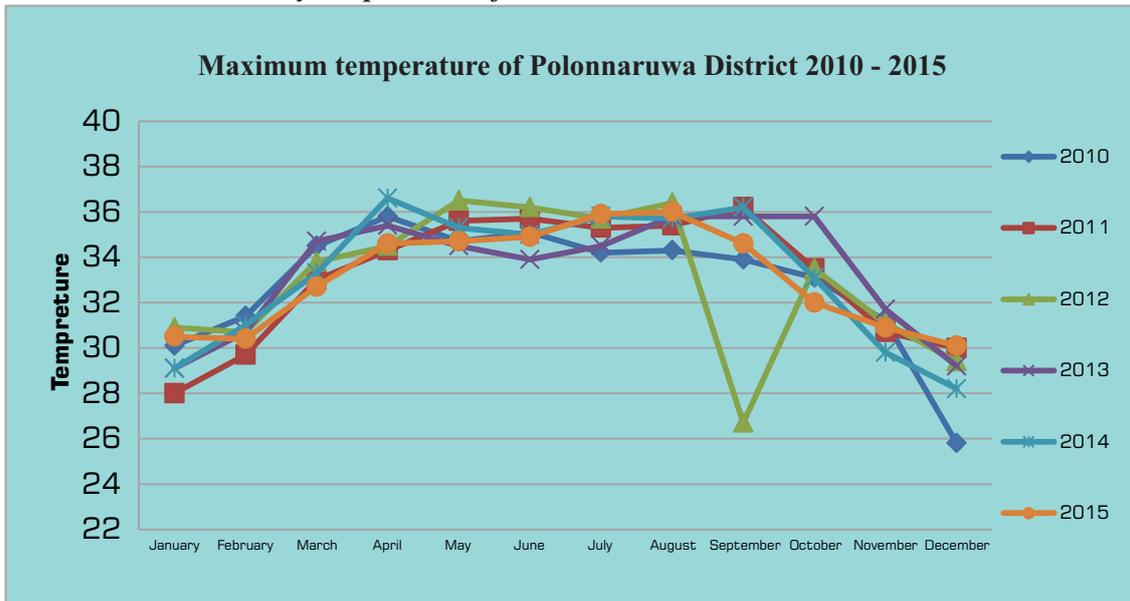
Source: Annual report 2018 "Pibidemu Polonnaruwa" Development programm

Annexure 2: Monthly rainfall in Polonnaruwa District 2009-2015



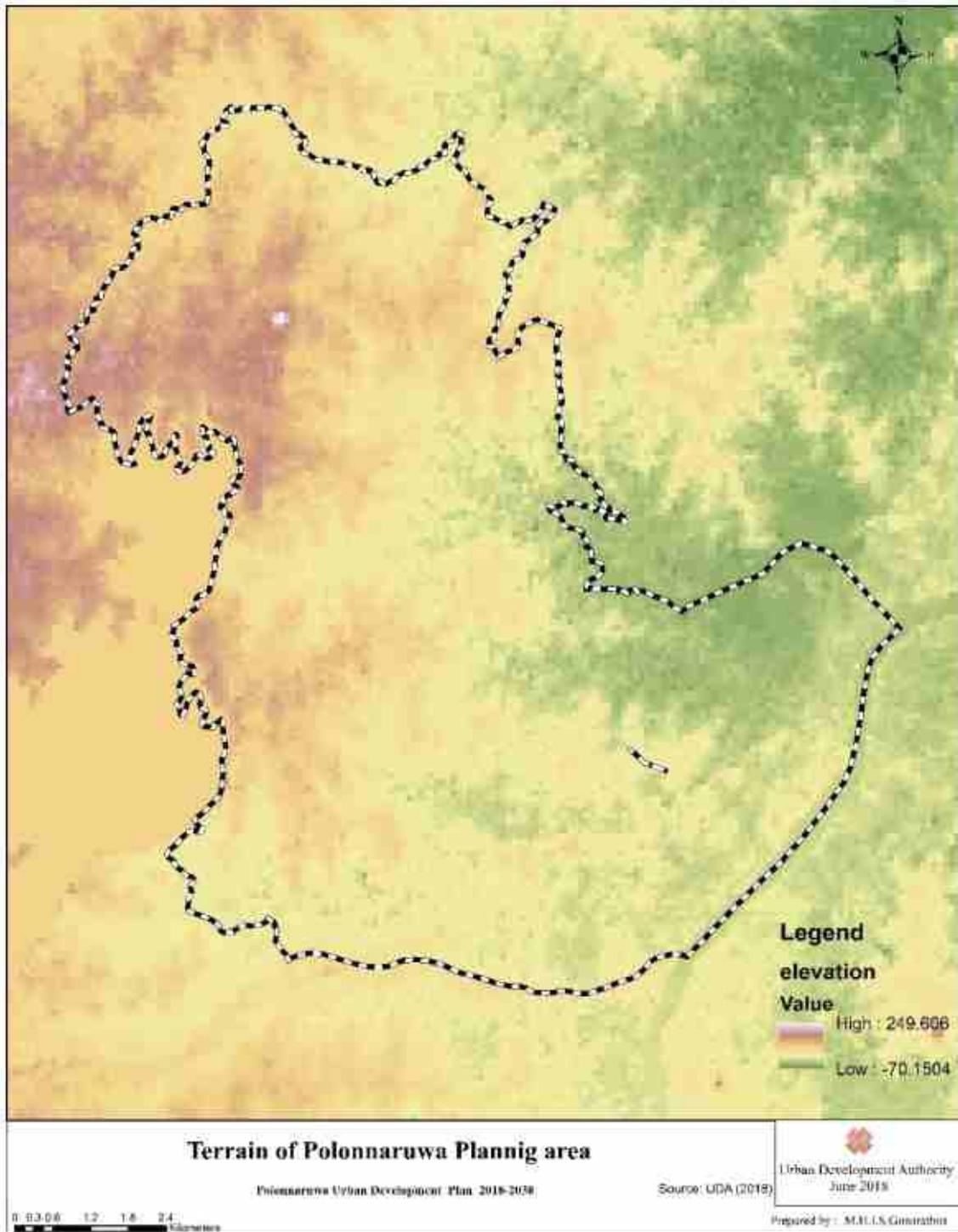
Source: Department of Meteorology - Sri Lanka

Annexure 3: Monthly temperature of Polonnaruwa District 2010-2015



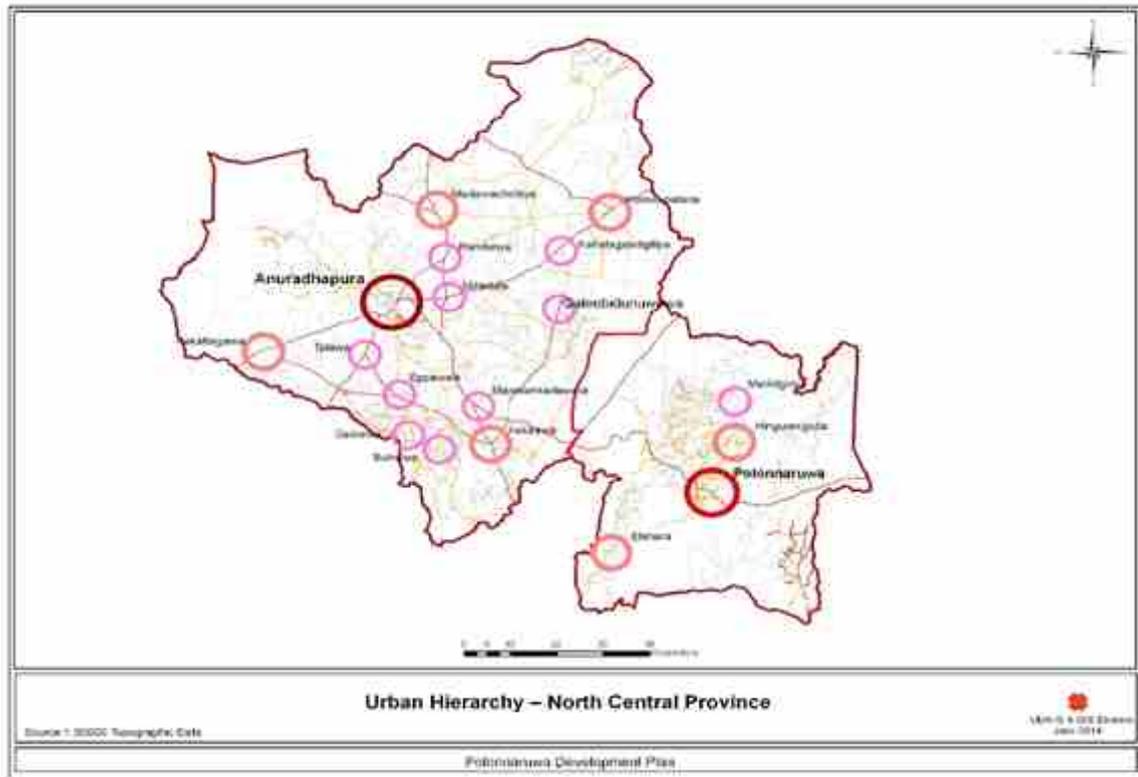
Source: Department of Meteorology - Sri Lanka

Annexure 4: Terrain map of Polonnaruwa Urban area



Source: Department of Meteorology Sri Lanka

Annexure 5 : Urban Hierarchy - North central province



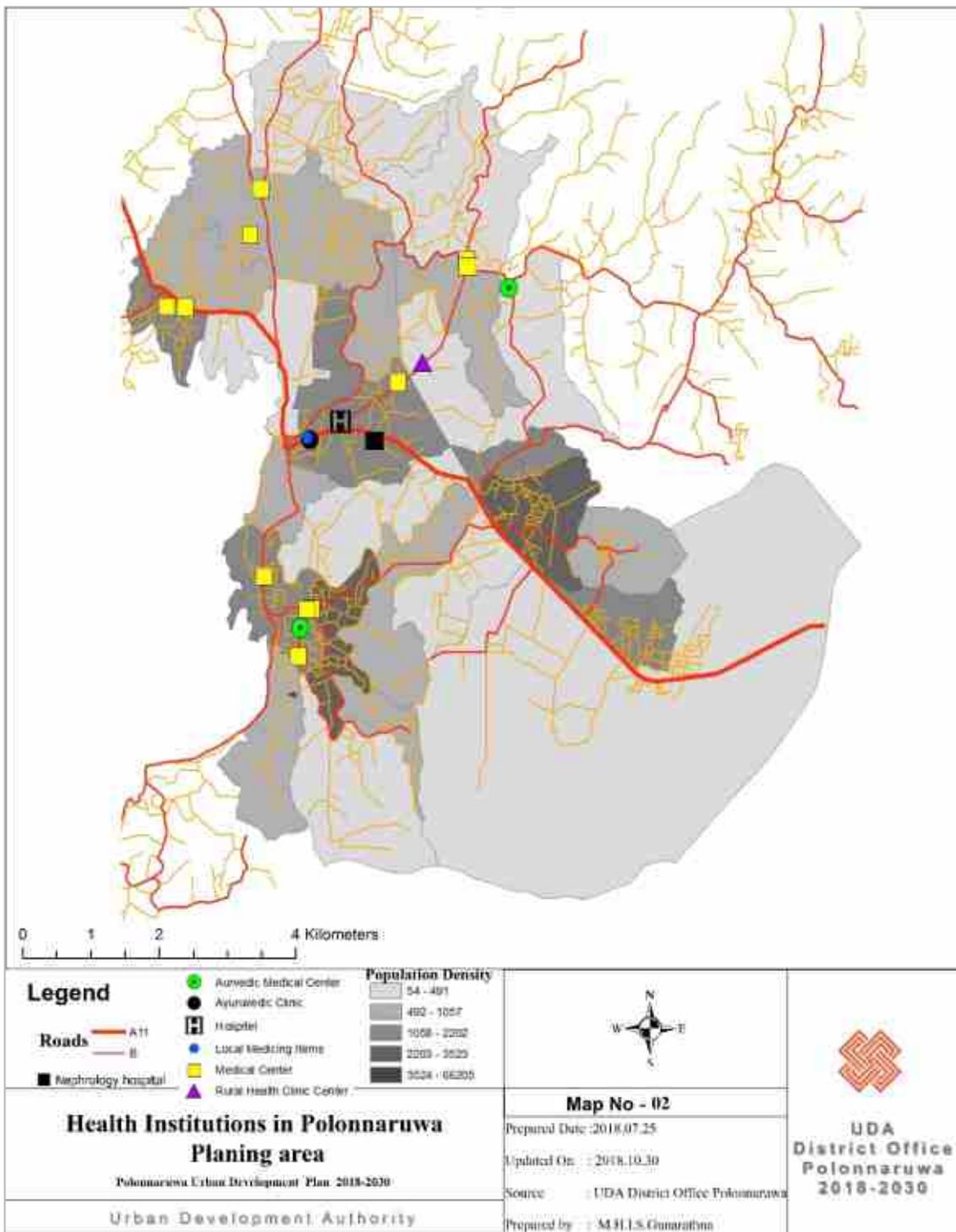
Source: surveys interviews and daily bus transit root details

Annexure 6 : Polonnaruwa City Catchment



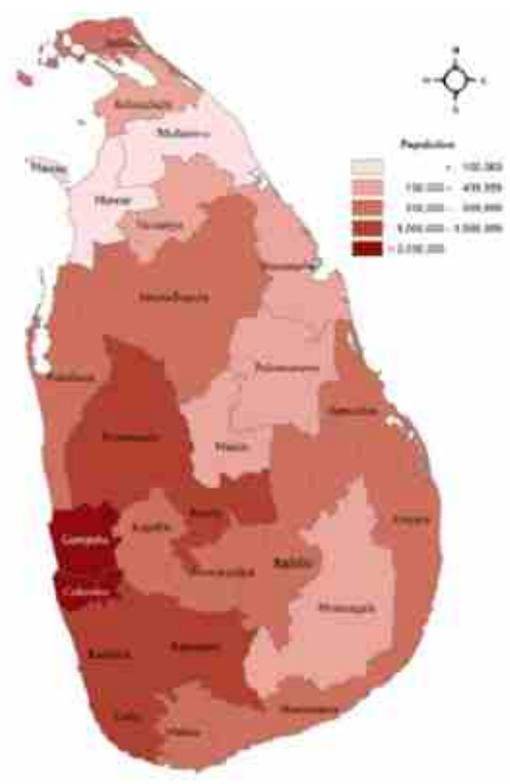
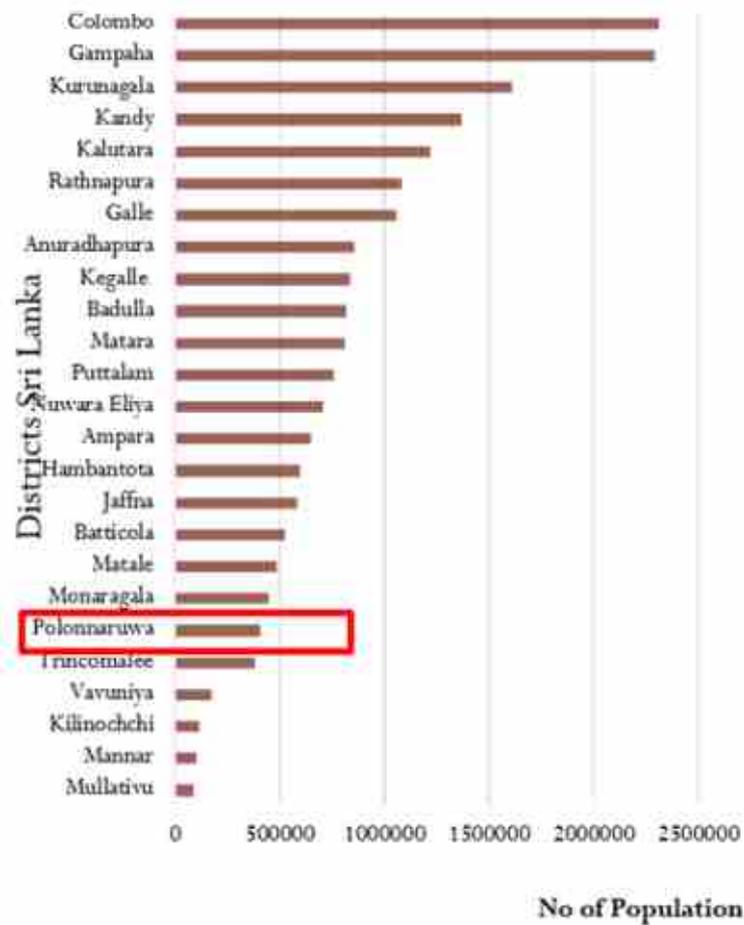
Source: surveys interviews and daily bus transit root details

Annexure 7 : Health Institutions in Polonnaruwa Planing area



Source: Field visit and Sampath pethikada 2017

Annexure 8 District wise Population distribution -Sri Lanka 2012



Source: Population and Housing of Sri Lanka 2012 Department of Census & Statistics

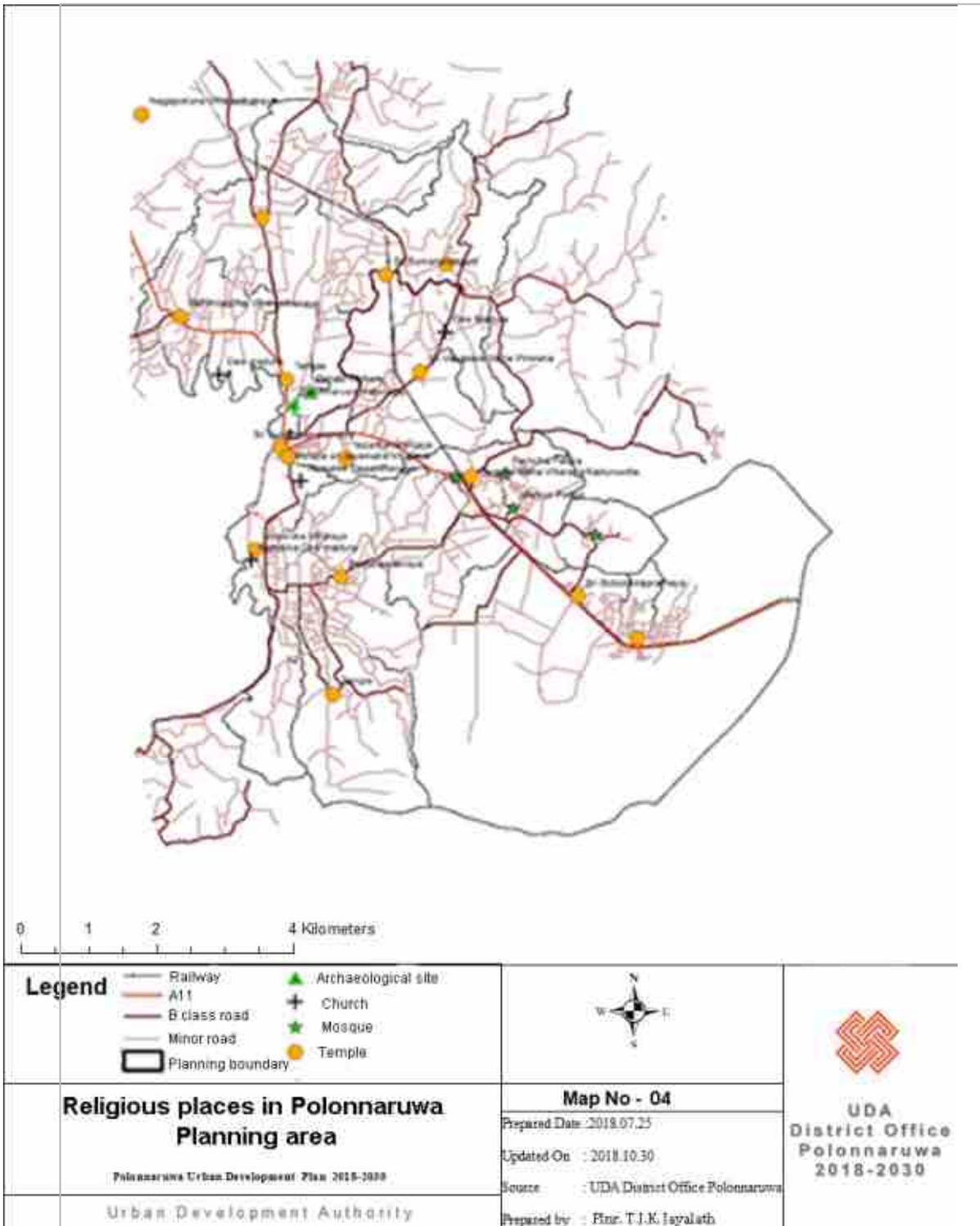
Annexure 9 *Population growth by District 1981-2012*

Table 3.3: Growth in population by districts, 1981- 2012

Districts	Total Population			Average Annual Growth Rate (%)		
	1981(1)	2001(2)	2012	1981-2001	1981-2012	2001-2012
Sri Lanka	14,846,274	18,797,257	20,359,439	1.16	1.02	0.75
Colombo	1,675,847	2,239,696	2,324,349	1.43	1.05	0.35
Gampaha	1,367,813	2,060,470	2,304,833	2.01	1.68	1.05
Kalutara	823,964	1,065,635	1,221,948	1.26	1.27	1.28
Kandy	1,032,335	1,276,202	1,375,382	1.04	0.92	0.70
Matale	352,860	439,031	484,531	1.07	1.02	0.92
Nuwara-Eliya	583,716	702,689	711,644	0.91	0.64	0.12
Galle	805,403	989,769	1,063,334	1.01	0.90	0.67
Matara	642,235	760,990	814,048	0.83	0.76	0.63
Hambantota	421,277	525,913	599,903	1.09	1.14	1.23
Jaffna	734,474	-	583,882	-	-0.74	-
Mannar	105,276	-	99,570	-	-0.18	-
Vavuniya	93,694	-	172,115	-	1.96	-
Mullaitivu	73,886	-	92,238	-	0.71	-
Kilinochchi	90,778	-	113,510	-	0.72	-
Batticaloa	329,343	-	526,567	-	1.51	-
Ampara	383,275	592,596	649,402	2.14	1.70	0.86
Trincomalee	250,771	-	379,541	-	1.34	-
Kurunegala	1,198,795	1,458,385	1,618,465	0.96	0.95	0.97
Puttalam	485,619	709,002	762,396	1.86	1.45	0.68
Anuradhapura	575,546	742,535	860,575	1.25	1.30	1.38
Poionnarawa	253,411	358,804	406,088	1.71	1.52	1.16
Badulla	620,839	778,422	815,405	1.11	0.88	0.43
Moneragala	269,684	396,521	451,058	1.89	1.66	1.21
Ratnapura	779,927	1,016,221	1,088,007	1.30	1.07	0.64
Kegalle	678,456	784,371	840,648	0.71	0.69	0.65

Source: *Population and Housing of Sri Lanka 2012 Department of Census & Statistics*

Annexure 10: Religious places distribution of Planning Area 2018

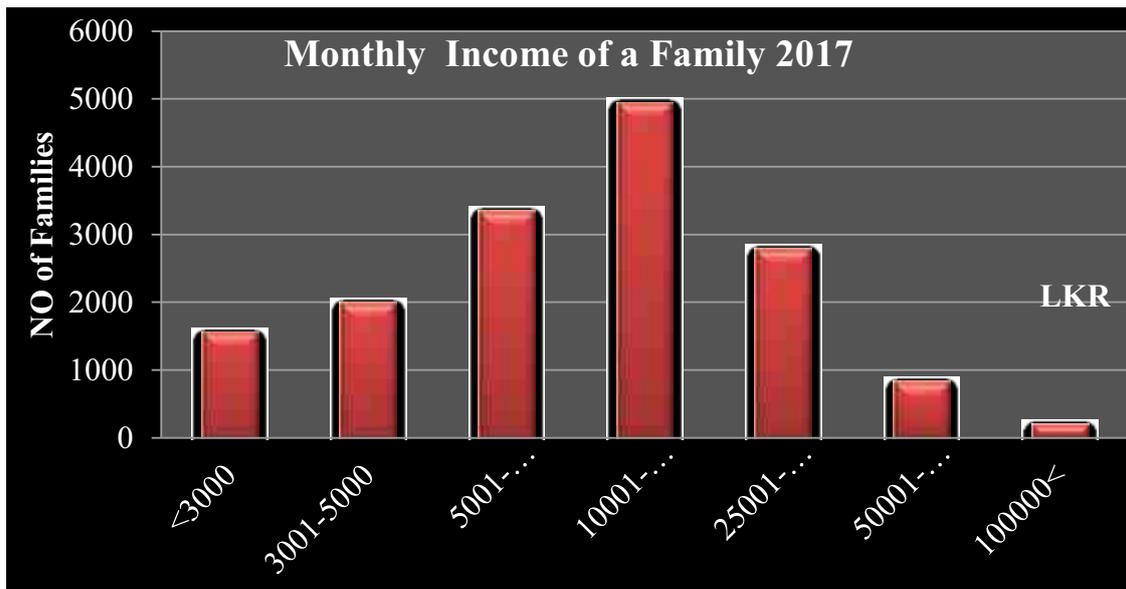


Annexure 11: Poverty Indicator by sector, province and district

Poverty Indicators by Sector, Province and District										
Sector / Province / District	Poverty Head Count Index (Percentage) by HIES Survey Period						Poor Household Percentage		Poverty Gap Index (%)	
	1990/91	1995/96	2001	2006/07	2008/10	2012	2006/07	2008/10	2006/07	2008/10
Sri Lanka	26.1	28.8	22.7	15.2	8.9	6.5	12.6	7.0	3.1	1.7
Sector										
Urban	16.3	14.0	7.9	6.7	3.3	2.4	5.0	3.3	1.3	1.2
Rural	29.5	30.9	24.7	15.7	9.4	7.3	13.1	7.5	3.2	1.8
Estate	20.5	32.4	30.0	32.0	11.4	6.2	25.3	8.9	6.2	2.1
Province										
Western	19.1	16.3	10.2	8.2	4.2	n.a.	6.5	3.0	1.5	0.2
Central	30.7	36.2	23.1	22.3	9.7	n.a.	18.2	8.2	4.6	1.8
Southern	30.2	32.6	27.2	13.2	9.2	n.a.	11.0	7.5	2.6	1.2
Northern	n.a.	n.a.	n.a.	n.a.	12.2	n.a.	n.a.	10.0	n.a.	2.1
Eastern	n.a.	n.a.	n.a.	10.2	14.8	n.a.	9.0	12.4	2.1	3.2
North Western	25.2	27.7	27.3	14.6	11.3	n.a.	12.2	8.2	2.9	2.4
North Central	24.5	24.7	21.5	14.2	5.7	n.a.	11.2	4.6	2.8	1.0
Uva	31.9	46.7	37.2	27.0	13.7	n.a.	25.2	12.0	6.2	2.4
Sabaragamuwa	31.0	41.7	33.6	24.2	10.6	n.a.	20.2	8.7	4.9	2.1
District										
Colombo	16.2	12.0	6.4	5.4	3.6	n.a.	3.9	2.3	1.0	0.7
Gampaha	14.7	14.1	10.7	2.7	3.9	n.a.	7.2	3.0	1.4	0.7
Kalutara	32.3	29.5	20.0	13.0	6.0	n.a.	10.3	4.1	2.7	1.3
Kandy	35.9	36.7	24.9	17.0	10.3	n.a.	13.9	8.3	3.8	2.2
Matale	22.7	41.9	29.6	18.9	11.4	n.a.	15.7	9.3	3.7	2.0
Nuwara Eliya	20.1	32.1	22.6	33.2	7.6	n.a.	27.3	7.1	6.8	1.0
Galle	29.7	31.6	25.2	13.7	10.3	n.a.	10.7	7.9	2.9	2.1
Matara	29.2	35.0	27.5	14.7	11.2	n.a.	11.7	8.3	2.4	1.7
Hambantota	32.4	31.0	32.2	12.7	6.9	n.a.	10.3	5.4	2.5	1.3
Jaffna	n.a.	n.a.	n.a.	n.a.	16.1	n.a.	n.a.	12.4	n.a.	2.8
Mannar	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Vovuniya	n.a.	n.a.	n.a.	n.a.	2.3	n.a.	n.a.	2.0	n.a.	0.3
Mullattivu	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Kilinochchi	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Batticaloa	n.a.	n.a.	n.a.	10.7	20.3	n.a.	9.3	17.0	1.5	5.1
Ampara	n.a.	n.a.	n.a.	10.9	11.2	n.a.	8.7	10.0	2.4	2.3
Trincomalee	n.a.	n.a.	n.a.	n.a.	11.7	n.a.	n.a.	9.0	n.a.	1.8
Kurunegala	27.2	26.2	25.4	15.4	11.7	n.a.	12.9	8.6	3.1	2.6
Puttalam	22.3	31.1	31.3	13.1	10.5	n.a.	10.6	7.5	2.3	2.0
Aaradhana	24.4	27.0	20.4	14.9	5.7	n.a.	12.7	4.6	2.8	1.0
Polonnaruwa	24.9	20.1	23.7	12.7	5.8	n.a.	10.0	4.3	2.2	1.0
Badulla	31.0	41.0	37.3	23.7	13.3	n.a.	21.0	10.9	5.3	2.1
Monaragala	33.7	36.2	37.2	33.2	14.5	n.a.	29.2	13.9	7.8	2.8
Kegonara	30.2	46.4	34.4	26.8	10.4	n.a.	21.3	8.5	6.3	2.4
Kegalle	31.2	36.3	32.5	21.1	10.2	n.a.	18.4	9.0	4.3	1.7

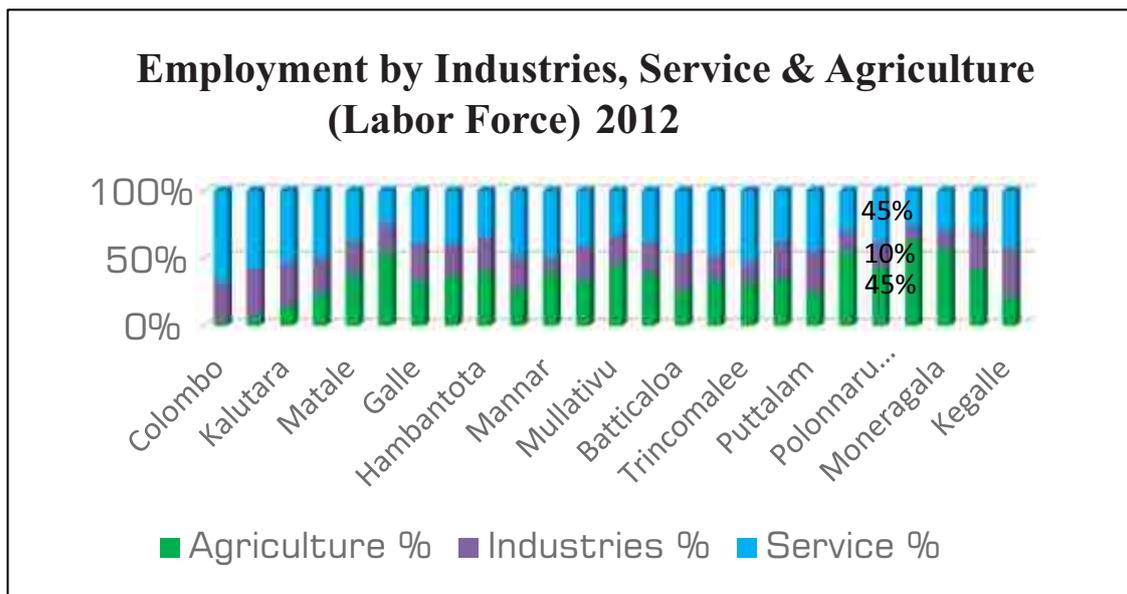
Source: Population and Housing of Sri Lanka 2012 Department of Census & Statistics

Annexure 12: Monthly income of a family Polonnaruwa Planning area 2017



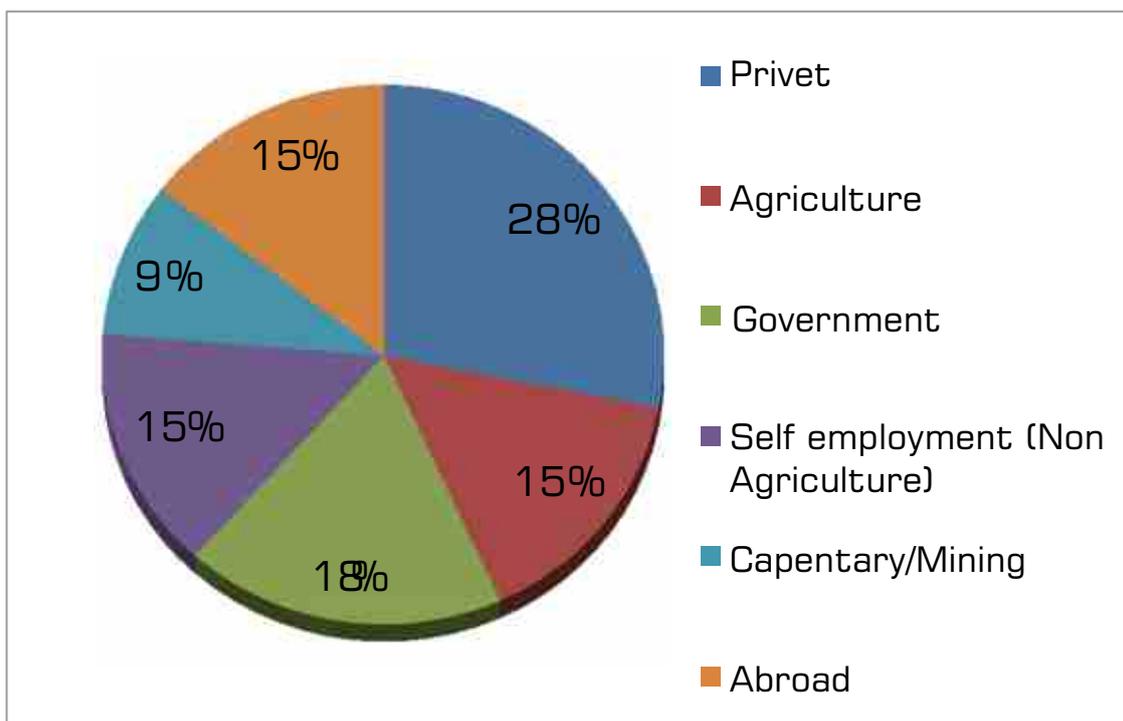
Source: Sampath Pathikada 2017

Annexure 13: Labour Force under each employment category



Source: Population and Housing of Sri Lanka 2012 Department of Census & Statistics

Annexure 14: Employment of each sector in Planning area



Source: Sampath Pathikada 2017

Annexure 15: Unemployment rate by district in 2011-2016

1.12 Unemployment rate by districts, 2011-2016

District	2011	2012	2013	2014	2015	2016
Total	4.2	4.0	4.4	4.3	4.7	4.4
Colombo	2.9	2.9	3.0	3.7	3.6	2.9
Gampaha	4.0	3.7	4.2	3.7	4.4	3.6
Kalutara	3.4	4.0	5.2	3.9	4.5	3.0
Kandy	6.1	7.2	4.7	5.0	5.4	4.4
Matale	*	2.8	6.7	5.2	5.3	7.6
Nuwara Eliya	*	1.8	3.4	2.9	3.2	4.6
Galle	3.8	2.3	4.9	4.6	5.0	5.1
Matara	6.0	7.0	7.1	6.9	6.5	6.5
Hambantota	6.6	5.3	5.1	6.7	6.3	5.2
Jaffna	*	5.1	5.1	5.6	5.7	7.0
Mannar	6.1	5.1	5.0	2.9	6.4	7.1
Vavunia	*	4.0	4.2	3.9	4.3	5.2
Mullativu	*	6.8	4.6	5.6	3.7	4.3
Kilinochchi	9.3	7.2	7.0	7.6	6.7	6.3
Batticaloa	*	5.1	3.7	3.9	4.6	6.2
Ampara	7.2	5.2	4.1	6.0	7.3	6.6
Trincormalee	*	4.4	5.7	4.3	4.3	3.9
Kurunegala	4.7	4.4	3.6	3.5	4.0	3.0
Puttalam	*	2.6	4.1	5.3	3.3	3.7
Anuradhapura	*	3.0	2.1	3.1	3.5	3.5
Polonnaruwa	*	4.3	6.2	3.7	2.3	2.5
Badulla	3.3	3.7	3.9	3.0	5.3	3.9
Moneragala	*	1.8	2.2	2.7	3.5	5.8
Ratnapura	3.1	4.4	4.6	3.7	4.2	4.4
Kegalle	5.4	2.9	7.4	7.6	8.3	6.9

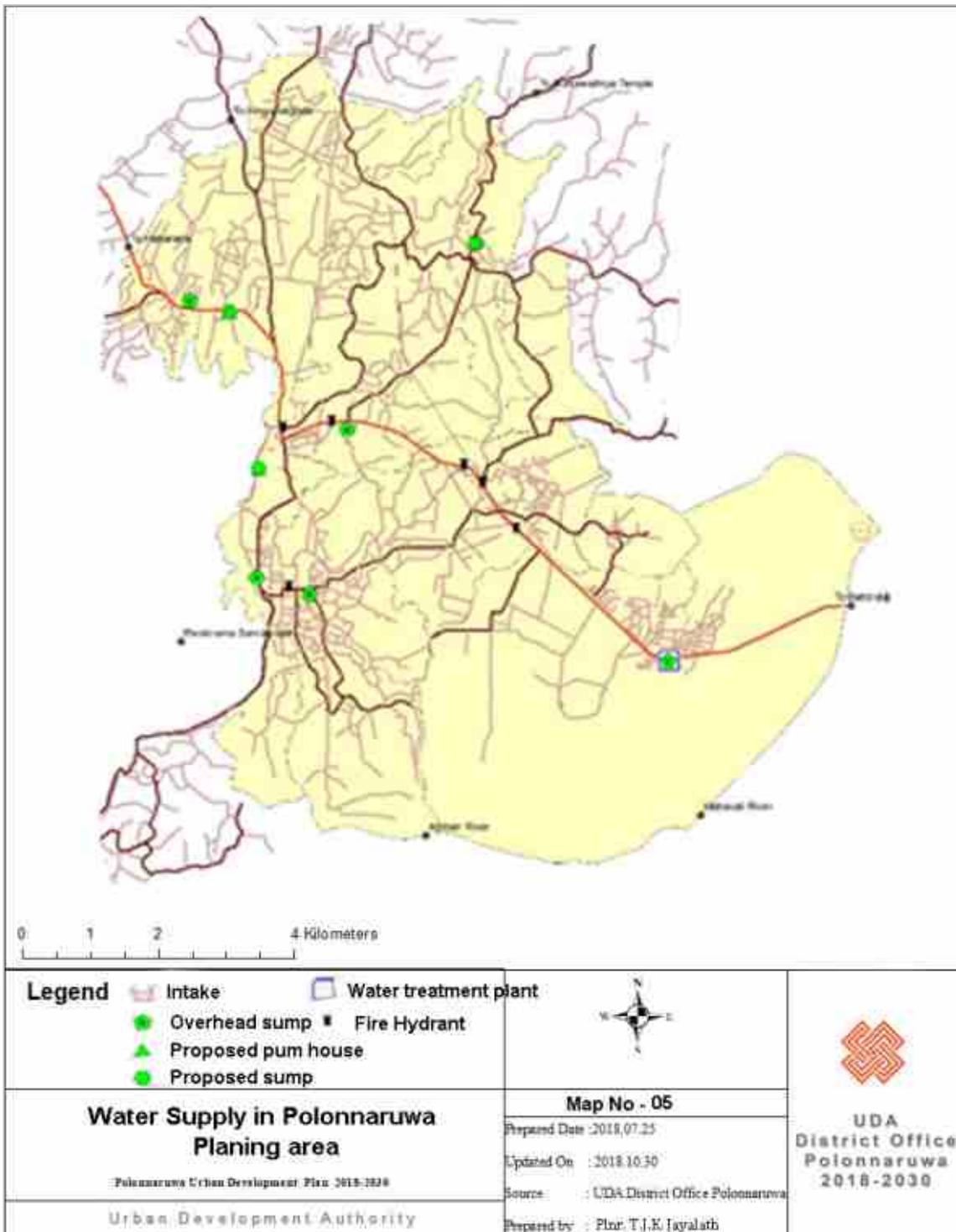
Source: Annual district report: census and statistic department 2016

Annexure 16: Economically active population by Districts in 2016

District	Economically active population (%)		
	Total	Male	Female
Total	100.0	63.8	36.2
Colombo	100.0	65.7	34.3
Gampaha	100.0	66.9	33.1
Kalutara	100.0	64.2	35.8
Kandy	100.0	63.5	36.5
Nuwara Eliya	100.0	59.9	40.1
Nuwara Eliya	100.0	55.6	44.4
Galle	100.0	63.7	36.3
Matara	100.0	62.1	37.9
Hambantota	100.0	66.1	33.9
Jaffna	100.0	73.6	26.4
Mannar	100.0	76.6	23.4
Vavunia	100.0	62.5	37.5
Mullativu	100.0	65.9	34.1
Kilinochchi	100.0	71.0	29.0
Batticaloa	100.0	70.5	29.5
Ampara	100.0	74.8	25.2
Trincomalee	100.0	74.9	25.1
Kurunegala	100.0	59.5	40.5
Puttalam	100.0	66.2	33.8
Anuradhapura	100.0	58.3	41.7
Polonnaruwa	100.0	67.3	32.7
Badulla	100.0	60.1	39.9
Moneragala	100.0	63.5	36.5
Ratnapura	100.0	61.0	39.0
Kegalle	100.0	58.6	41.4

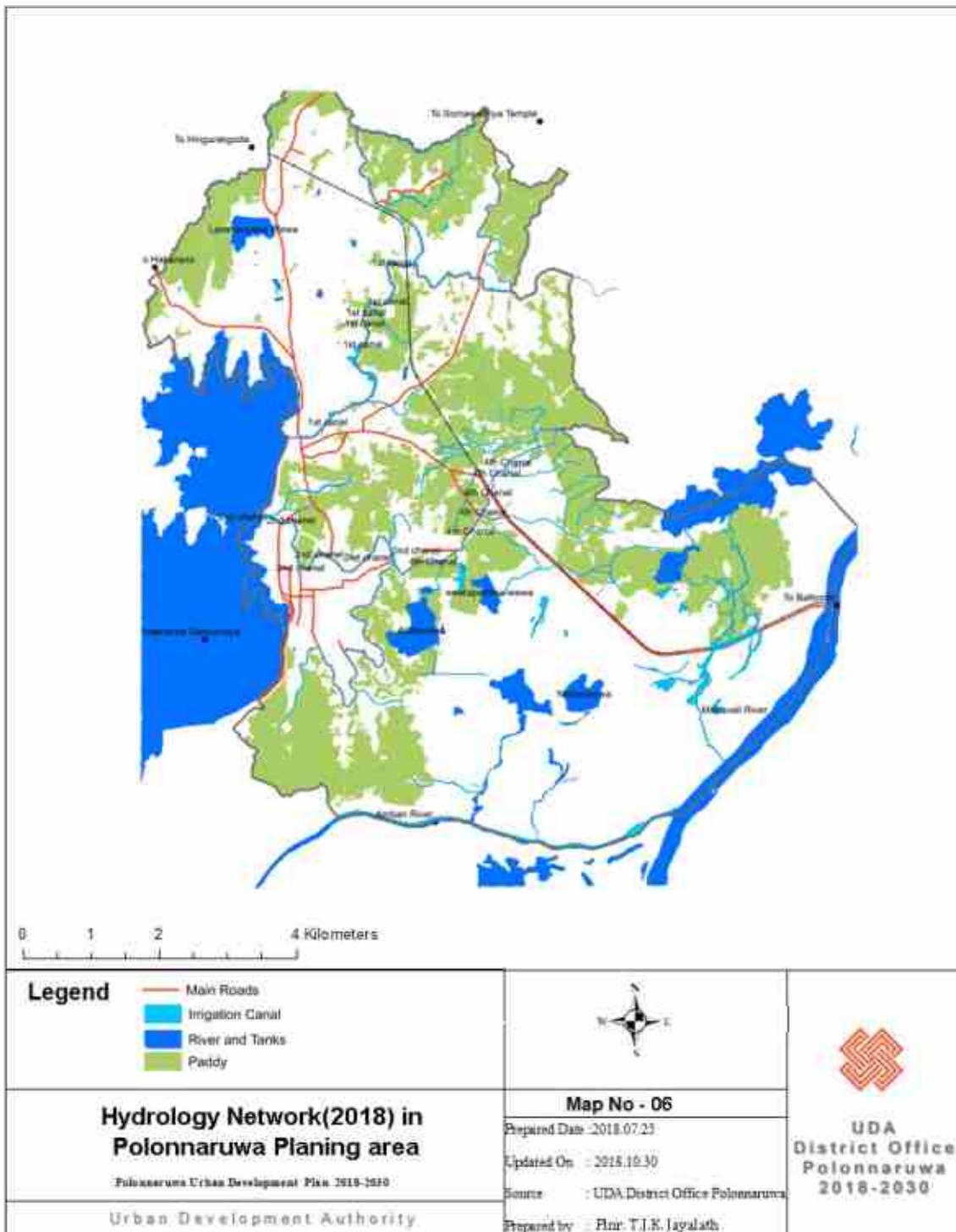
Source: Census and statistic Department - Labour Force Survey Annual Report – 2016

Annexure 17: Water supply of Planning Area 2018 by National water supply and drainage board



Source: NWSDB Annual Report – 2017

Annexure 18: Hydrology network in Polonnaruwa Planning area 2018



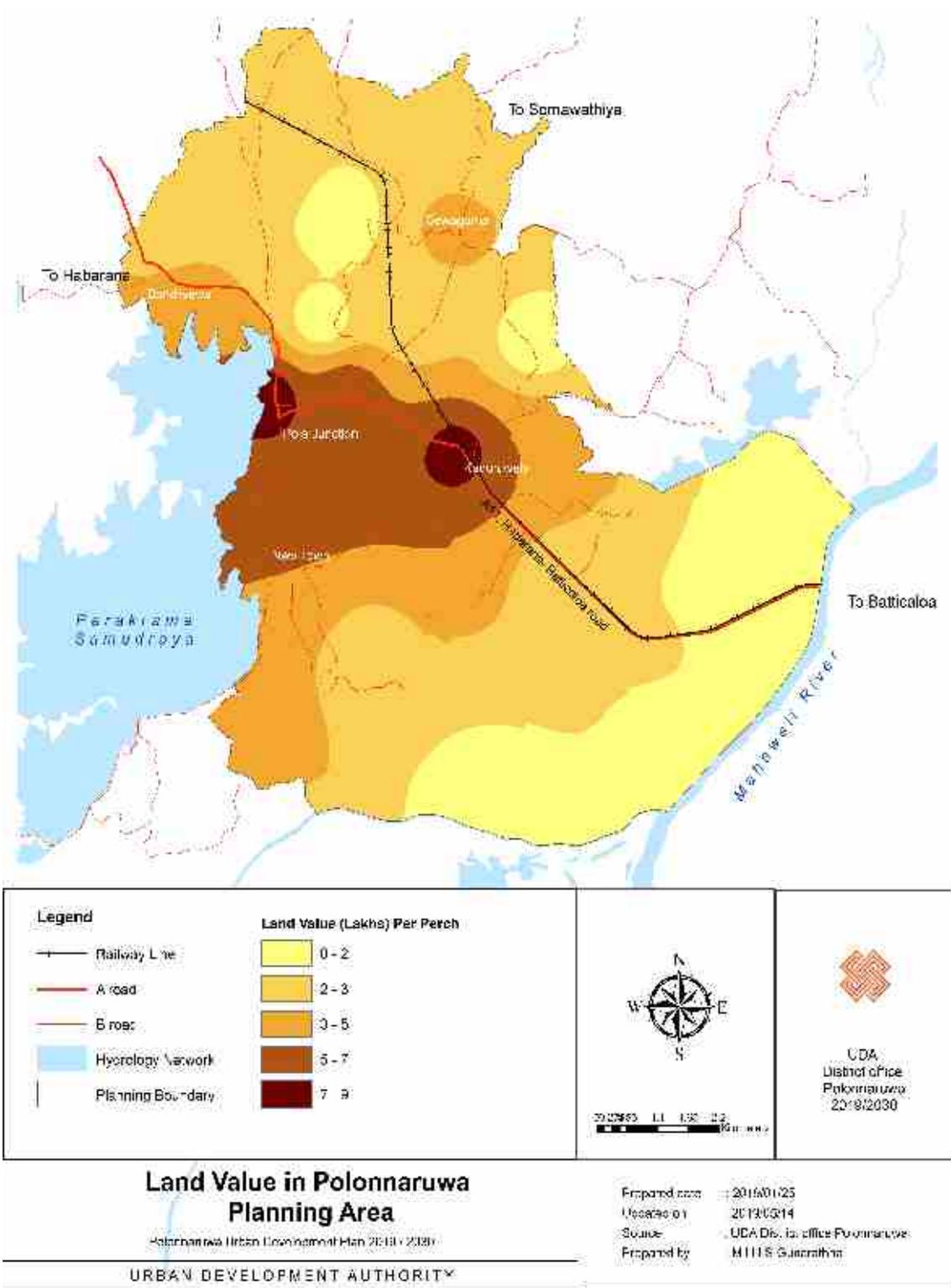
Source: Land use planning department -district office Polonnaruwa

Annexure 19: Electricity supply in planning area



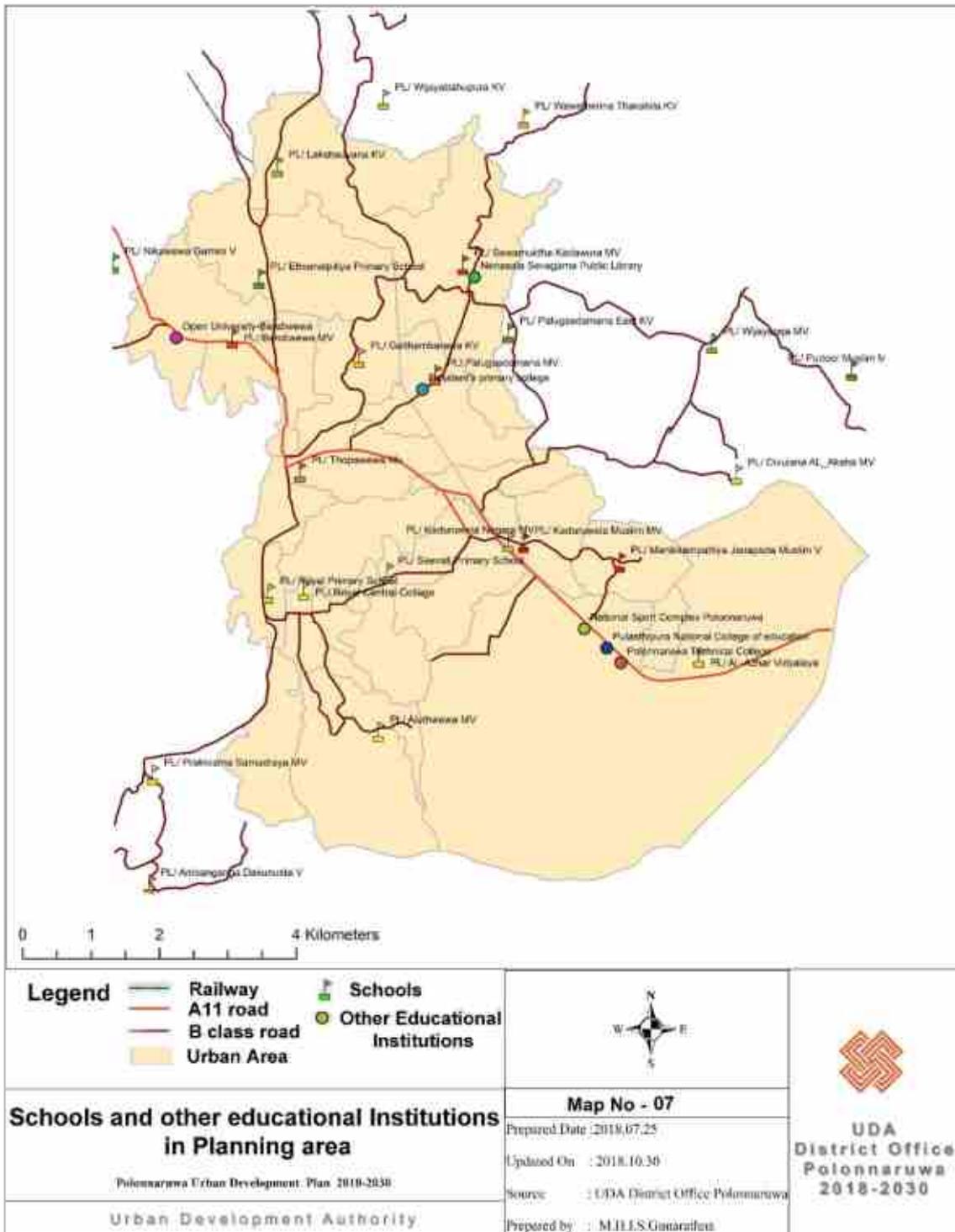
Source: Ceylon Electricity Board and field visit

Annexure 19: Land Value of Planning area - 2018



Source: Field Surveys - 2018 District Office Polonnaruwa - UDA

Annexure 21: Schools and other educational institutions in planning area



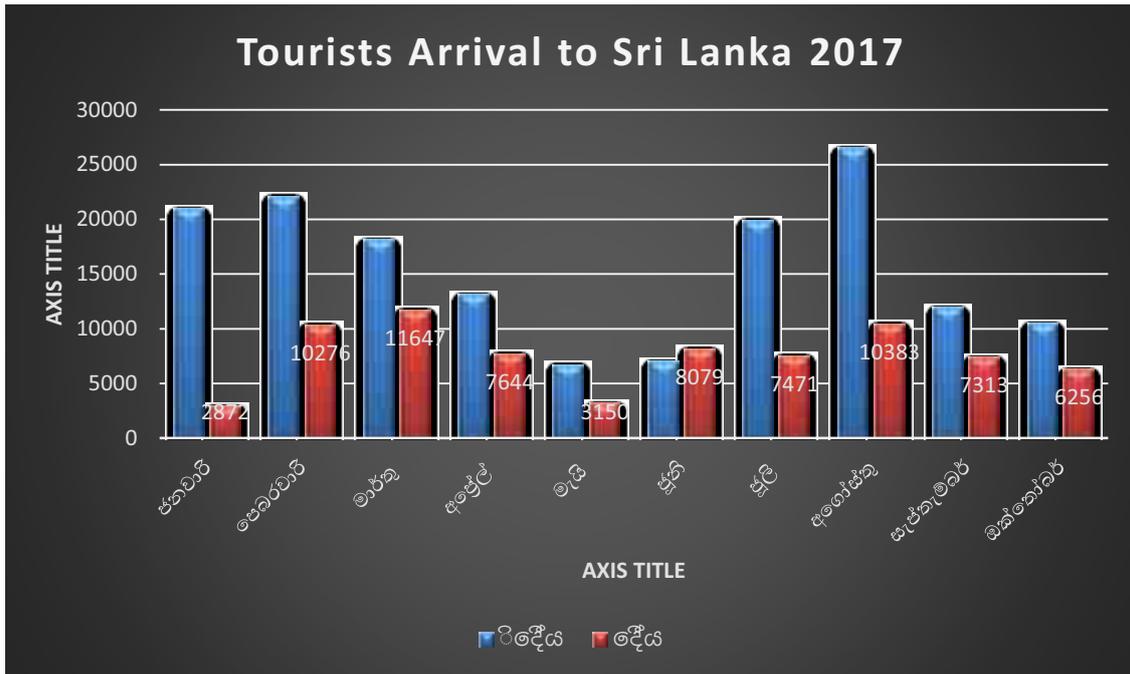
Source: Field visit and Sampath pethikada 2017

Annexure 22: Land use planning area 2018

Type of land use	Area Extend (km ²)	% from total land
Rock, Distorted Surfaces & Barren land	0.0099	0.01%
Industries and Rice	0.01492	0.01%
Cemetery	0.021404	0.02%
Hospital	0.032083	0.03%
Coconut Monocrop	0.043602	0.04%
Scrub	0.125316	0.12%
Abandoned Tank	0.23682	0.23%
Other Crops	0.306815	0.30%
Factory & Rice Mills	0.321878	0.31%
Other Water bodies	0.585341	0.57%
Chena	0.920492	0.89%
Commercial	1.210746	1.17%
Playground	1.657306	1.60%
Tank	1.801472	1.74%
Villu	2.694264	2.60%
Archaeological Reservation	4.192764	4.05%
Grass Land	7.845109	7.58%
Wildlife Reservation	16.86547	16.30%
Paddy Irrigated	31.82688	30.74%
Homestead	32.81693	31.70%

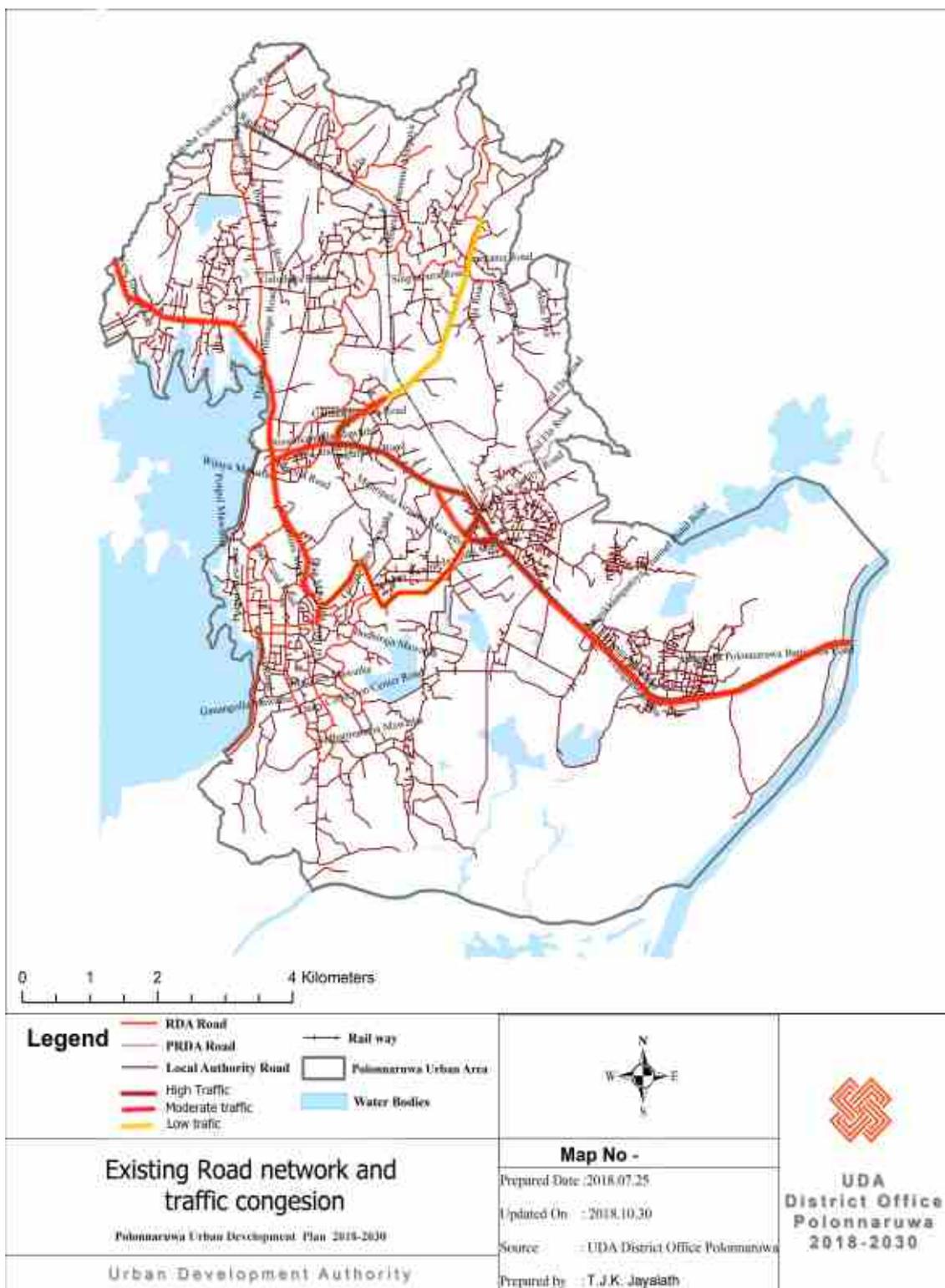
Source: Geo database: Polonnaruwa -UDA Polonnaruwa district office

Annexure 23: Tourist arrival to Polonnaruwa in 2017



Source: Tourist Development Authority-Annual Report

Annexure 24: Existing Road network and traffic Congestion



Source: Field visit and Geo database Polonnaruwa: UDA district office Polonnaruwa

Annexure 25: Existing Parks & Playground in Polonnaruwa Urban Area - 2017

No	Type of Parks & Playground	Extent (ha)	Existing Use/Uses	GN Division
	Pocket Park			
01	EPP ₁	0.2	Playground	Mahasenpedesa
02	EPP ₂	0.1	Children's Park	Weerapedesa
	Total	0.3		
	Mini Park			
02	EMP ₁	0.9	Playground	Perakumpedesa
03	EMP ₂	0.4	Playground	Kotaleeya
04	EMP ₃	0.9	Playground	Pothgulpedesa
05	EMP ₄	0.3	Playground	Mahasenpedesa
06	EMP ₅	0.5	Playground	Nissankamallapura
07	EMP ₆	0.7	Playground	Samudragama
08	EMP ₇	0.3	Playground	Kuruppuhandiya
09	EMP ₈	0.9	Playground	Sirisagabopedesa
10	EMP ₉	0.5	Open Area	Bandiwewa
	Total	5.4		
	Local Park			
11	ELP ₁	1.6	Playground	Udawela
12	ELP ₂	2.4	Playground	Weerapedesa
13	ELP ₃ (Deepa Uyana)	1.2	Park	Bandiwewa
	Total	5.2		
	Central Urban Park			
14	ECUP ₁	8.4	Sport Complex	Kotaleeya
	Total	8.4		
	Grand Total	19.3		

Source : Landscape planning division: UDA

Annexure 26: Proposed Public Outdoor Recreational Space Plan for Polonnaruwa Urban Area – 2030

No	Type of Parks & Playground	Extent (ha)	Present Use/Uses	Proposed Use	GN Division
Proposed Pocket Park					
01	PPP ₁	0.1	Vacant Land	Pocket Park	Kaduwela - East
02	PPP ₂	0.2	Vacant Land	Pocket Park	Polonnaruwa Town
	Total	0.3			
Proposed Mini Park					
03	PMP ₁	0.4	Vacant Land	Mini Park	Kaduruwela - South
04	PMP ₂	0.3	Vacant Land	Mini Park	Kaduruwela - East
05	PMP ₃	0.5	Abandoned Paddy	Mini Park	Kaduruwela - West
	Total	1.2			
Proposed Local Park					
08	PLP ₁	1.1	Vacant Land	Local Park	Kaduruwela-South
09	PLP ₂	1.4	Vacant Land	Local Park	Gallella - West
10	PLP ₃	2.5	Open space	Local Park	Sirisagabopedesa
11	PLP ₄	2.0	Open space	Local Park	Mahasenpedesa
12	PLP ₅	1.4	Scrub	Local Park	LakshaUyana
13	PLP ₆	2.2	Scrub	Local Park	Ethumalpitiya
14	PLP ₇	3.0	Scrub	Local Park	Sewagama
	Total	13.8			
Proposed Linear Parks (PLi.P)					
15	PLiP ₁ (Buffer Zone - - 100m)	132.7	Parakrama Samudraya	Linear Park	
16	PLiP ₂ (Ela Reservation- 10m)	34.0	1 st Canal	Linear Park	
17	PLiP ₃ (Ela Reservation- 10m)	15.7	2 nd Canal	Linear Park	
18	PLiP ₄ (Ela Reservation- 10m)	39.9	4 th Canal	Linear Park	
	Total	222.4			
Proposed Forest Park (PFP)					
21	Proposed Forest Park	1513.5	Flood Plains National Park	Forest Park	
	Total	1513.5			
	Grand Total	1751.2			
<i>Source: Landscape planning division: UDA</i>					

Annexure 27: Proposed infrastructure development projects in sacred area.

Heritage location	Parking facilities	Improving Accessibility	Electricity supply	Description board	Sanitary facilities
Inner City	To remove the embarrassment due to the position of the Parakramabahu I car park in the area, the entrance to the new car park in front of the main gate	It is proposed to close the existing route for the Parakramabahu sovereign and to get them to be further streamlined. The crossing near the Kumara pond is to be shut down in future	The Parakramabahu Temple is provided with lighting for the lamps. It is proposed to provide light at the front of the courtyard there is a lamp to be installed.	Descriptive boards of the required sites are used by the Central Cultural Fund. The tablets near the monument are proposed to be sent to the central cultural fund at the entrance to the memorial plan of the monument at the entrance to the wewa.	
The main entrance to the inner city and the area around No. 01 Siva Devala		The existing access roads to the main entrance should be modernized and access roads to No. 01 Sivas should be completed and the existing paths should be closed down. The area should be planted with grass and maintained at gardens. It should be maintained from the Devalaya to the Temple of the Tooth Relic again. It is proposed to install the old access road to the west on the Ω is proposed to close the eastern section of the east	it is proposed to provide light to all three locations covering the Shiva Temple of the main gardens of the main gates.	Fast speeds must be added to the insert board for inscriptions	

Heritage location	Parking facilities	Improving Accessibility	Electricity supply	Description board	Sanitary facilities
<p>Sacred Tooth Relic palace</p>	<p>It is planned to remove the car park near Parakramabahu's palace and set up the new tower at the entrance to No. 1 Siva Devale in front of the main entrance of the new bus station and entrance to the No. 1 Siva Devale. It is proposed to be located on the 82 m 30-meter area. It is proposed to provide infrastructure with four water taps</p>		<p>It is proposed to add light for light on the centre of the Ω on the centre of the ellipse, covering the largest building complex Ω in the direction of the centre of the city. It is proposed to have a bubble that will light up everywhere.</p>	<p>The Central Cultural Fund has information leaflets for the places, while loading boards are required for letters to the letters on the walls of the Galpotta, Nissanka Malla, Etisalat letters and Watadage walls.</p>	<p>The existing stalls in this area will be removed and proposed to be repositioned in the proposed new car parks.</p>
<p>Pabalu Vehera and Shiva Devalaya areas</p>	<p>A small car park is to be established for this area</p>	<p>It is proposed to resettle the floodwaters from the eastern entrance to the main highway and to close the roads to the Ω Vehera and the Siva devalaya from the same path. However, it is proposed to set up low level installations</p>	<p>It is proposed to resettle the floodwaters from the eastern entrance to the main highway and to close the roads to the Ω Vehera and the Siva devalaya from the same path. However, it is proposed to set up low level installations</p>	<p>the entrance of the outer city, a landmark for the northern gate should be applied and a position mark should be placed at the place vhera at the starting point of the pavement</p>	
<p>Manik wehera Complex</p>			<p>It is proposed to use two lamps for the Sthupaya.</p>		<p>A watch store is installed. The Guinness World War Office maintains a Central Cultural Fund for the day or night</p>

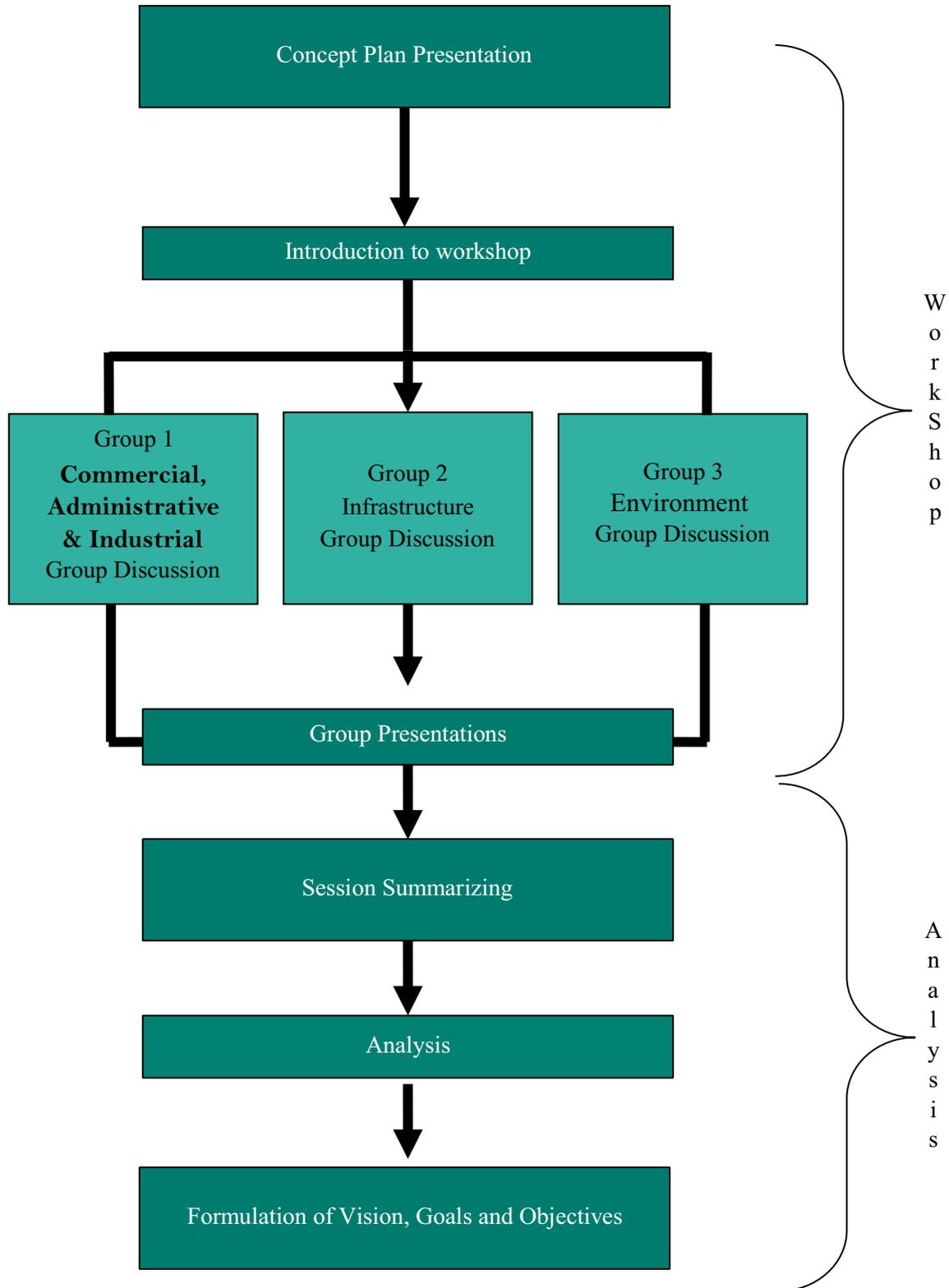
Heritage location	Parking facilities	Improving Accessibility	Electricity supply	Description board	Sanitary facilities
Rankoth wehera complex	the undergrowth of the section on both sides of the sacred area of the reserve is proposed to be removed as a car park	The paths from Ω gala to the Rakotte Veheram should be reconstructed while the path leading to the Aditya building near Ran Kottahara should be set up and the public will not be allowed to walk.	It is necessary to give light to cover the car park and the golden roof		It will also provide drinking water facilities
Demala maha seya		This is a special project site and it is proposed to install the access road to the existing access road leading to the Demala maha seya from the vicinity of the Thivanka pilima geya to Gal viharaya.			
Alahana Pririwen Complex			The light from the Rakotte Vehera to the Alahana Pirivena complex should be illuminated and the Lankathilaka and the security buildings should be provided to the Hivili tavern.		

Heritage location	Parking facilities	Improving Accessibility	Electricity supply	Description board	Sanitary facilities
Galviharaya complex	As proposed to install 16 stalls in the center of the place where the manufacturing car is located, since it does not cause damage to the landscaping, it is proposed to arrange for the seats to be used in the lower shafts and shafts of shady areas along the width and width of the shady areas.	The route from the car park to the Galhuya Viharaya is still maintained. From the main pilgrimage to the Galgamuwa vihara, the existing stones are now removed from the main harbor and prevented by a small gate from the left to close the gardens. It should be planted in the premises of the site, and the villagers who come to the Gal Vihar should take a passage from the turning gate from the boundary to the reserve which is outside the village. After closing this intermittent block, the unauthorized access closes from the intermittent mid-march, from there, it is proposed to extend the direct road up to Gal Vihara and connect it to the road to the village	It is expected to supply electricity to the main passage from the car park to the Gal Viharaya and connect it to the roof of the statue of the Gal Vihara and provide light and electricity through the proposed tank.	A board should be displayed to indicate the use of rest rooms	Three toilets are being proposed and one set at this moment is being constructed while the other two sets of buildings are to be constructed

Heritage location	Parking facilities	Improving Accessibility	Electricity supply	Description board	Sanitary facilities
No 16 nelum pokuna	A car park is being installed to use conservation methods to prevent the outpouring of the old wall in the car park.	Set a small beam from the main flight to the pond			
Siwa tempel and Nayi pena wiharaya		The existing pathways for Siva Devale No. 5 should be systematized and it is proposed to probe a new direction to shrink to the Siva Devalaya from the main pilgrimage to the right		Shiva Devale 5 front (from main traffic to right) is proposed to be installed in front of the main access board	
Nisshanka Pavilion)		It is proposed to prepare a small flystip to the Prayer Seat towards the Parakrama Samudra from Nisshan Mosque Pavilion.	proposed to supply electricity from main road.	In addition, an inscription board and cover fence for the inscription of the Nissanka Dhamana Tampa should be applied and a landmark is proposed for the Kali Kovil situated on the left side of the main harbor.	
Creation of Pothgul temple			It is proposed to provide light to the Pothgul Vihara and the Parakramabahu sacred area.		It is proposed to provide toilets for this purpose since the existing toilets are not sufficient
Outer City Bound				It is proposed to apply every bar to the plaque outside the wall	Conservation of the protected areas to the level of the earth

PREPARATION OF POLONNARUWA DEVELOPMENT PLAN - STAKEHOLDER MEETING - NVIVO ANALYSIS

Stakeholder Meeting Conducting Process



Group Categorization

Polonnaruwa stakeholder meeting was held on 13rd of October. Meeting conduct by separating stakeholders into three groups and each group discussions were analyzed according to their comments. The analysis was based according to the identified problems and potential of Polonnaruwa .

Group 01 – Commercial, Administrative & Industrial

- Divisional Secretariat Office
- People's Bank
- Three-wheel Association
- Board of Investment
- Mawbima Newspaper – Journalist
- Trade Union Association
- Grama Niladhari
- District Secretariat
- Sri Lanka Land Reclamation and Development Cooperation
- Disaster Management Centre
- Polonnaruwa Main Church Assembly
- Jayanthi Maha Viharaya
- North Central Provincial Council
- Archeological Department
- Isipathanaramaya

Group 02- Infrastructure

- Polonnaruwa Railway Station
- National Vocational Training Institute – Polonnaruwa
- Grama Niladhari
- Sri Lanka Telecom
- Public Health Inspector
- Sri Lanka Transport Board
- Road Development Authority
- Ceylon Electricity Board
- Polonnaruwa Base Hospital
- National Water Supply & Drainage Board
- Ceylon Railway Department

Group 03- Environment & Agriculture

- National Aquatic Development Authority
- Wildlife Conservation Department
- Survey Department
- Grama Niladhari
- Coconut Cultivation Board
- Central Environment Authority
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Analysis Results of Group 02 - Environment & Agriculture



Group 03 most frequently discussed about conservation of archeological sites, agriculture sector, environment in Polonnaruwa

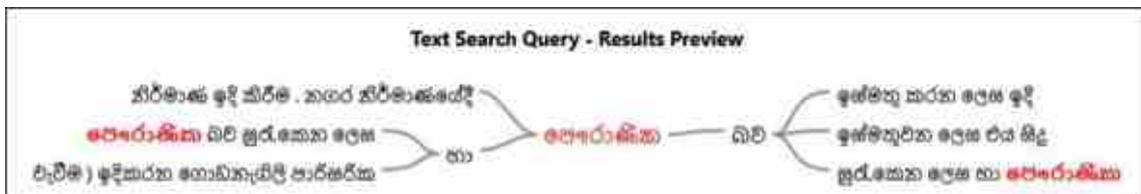
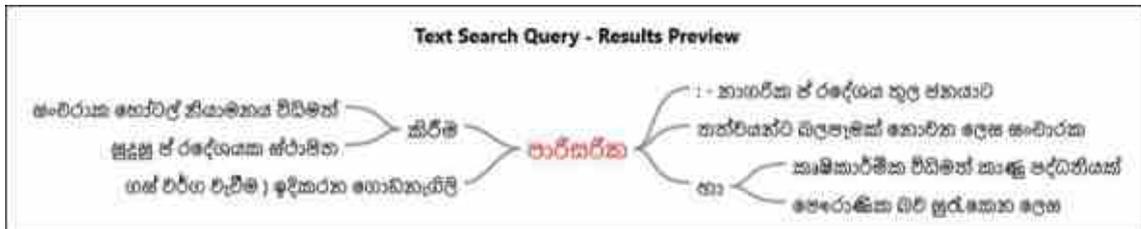


Overall word cloud highlighted most discussed areas by all groups, so this conclude the overall discussion of each groups and through this analysis Considering whole interpretation of each groups mainly focused about Tourism, Environment, transportation

Through this analysis, can identified what are the key areas where every group has addressed and what are the key points that should be highlight in future development plan.

OVERALL WORD TREES

After identified main key words from word cloud then found how the discussion link with key words. This word trees represents connection between each sector and when considering overall word cloud picture Tourism, Environment, transportation can identify as main discussed sectors of Polonnaruwa.





The base of the Nodes was taken from overall word clouds and overall word trees of each groups. According to the Nodes word cloud the area should focused to vision as based on following sectors.

1. Tourism Development
2. Industry Development
3. Preservation of Archeological sites

Identified Problems and Potentials

Problems	Identified Causes
Improper management of sewerage disposal and solid waste disposal	<ul style="list-style-type: none"> • Due to the presence of groundwater in this area, the water is not absorbed into the earth; therefore, the toilets are constantly flooded in Kaduruwela and Polonnaruwa town area • At present, there is no proper dumping sites to dispose solid waste.
Increasing trend of authorized paddy land filling	Paddy Land filling – due to implementation of special development projects eg: Kaduruwela town area, under construction four lane road in polonnaruwa town
No proper way to manage waste water among and within the cities	No proper flattened and well-connected drainage network. Eg: Kaduruwela “Somiyel” junction

Potentials

- Named as Polonnaruwa UNESCO world heritage site
- Established value-added market for paddy
- Well-connected cascading system

Conclusion of Analysis

Stakeholder meeting results can be concluding as main three sectors according to the analysis. Analysis interprets the way development plan should address Polonnaruwa town. According to that Tourism Development, Agricultural Industrial Development and Preservation of Archeological sites should be the main considering areas of development plan. Through this overall analysis it shows the way that Vision, Goals, and Objectives of the Polonnaruwa Development plan should focus.

Vision

The Glorious Ancient city

Vision Statement

Expose the culture and heritage of Polonnaruwa to the world with partnership of people, development and city identity

Goals

- Create Polonnaruwa as the best heritage tourism destination
- Upgrade city dwellers economy with agro based industries and tourism

Objectives

- To ensure the protection & sustainability of archeological resources while promoting heritage tourism
- To provide a self-sustained living condition while connecting with culture, heritage to city dwellers
- To create proper plans and standards for upgrade qualitative and quantitative agriculture production
- To enhance the quality and quantity of drinking water supply