STAKEHOLDER ENGAGEMENT IN SMART CITY PROJECTS IN SRI LANKA

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DECLARATION

"I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Further, I acknowledge the intellectual contribution of my research supervisors Mrs. B.H. Mallawaarachchi and Dr. (Mrs.) K.G.A.S. Waidyasekara for the successful completion of this research thesis. I affirm that I will not make any publication from this research without the names of my research supervisors as contributing authors unless otherwise I have obtained written consent from my research supervisors.

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ABSTRACT

STAKEHOLDER ENGAGEMENT IN SMART CITY PROJECTS IN SRI LANKA

Escalating challenges in the modern cities with the rapid urbanisation has initiated the need of sustainable urban development. Smart Cities are identified as the most suitable solution in achieving sustainable urban development. The concept of Smart Cities have created an anticipation in Sri Lanka and strategic plans are being developed in enabling Smart Cities in Sri Lanka. Though there is a growing requirement in developing Smart Cities, Smart City projects entails certain challenges, which are required to be resolved in order to achieve success of the project. Enabling the effective engagement of the stakeholders in the project is identified as a key for the achievement of successful Smart City projects. Therefore, the scope of this research focuses on enabling stakeholder engagement in Smart City projects in Sri Lanka.

The research was conducted by utilising the explanatory sequential mixed design under mixed research approach. A comprehensive literature synthesis was conducted in order to review the concept of Smart Cities, importance of Smart Cities in sustainable urban development and to identify the characteristics of Smart City projects. Moreover, stakeholders in Smart City projects and their contributions were identified through the literature review. Subsequently, a desktop study was carried out in order to identify stakeholders and their contributions in urban development projects in Sri Lanka. After the comparison of the findings of the literature review and the desktop study, a list of stakeholders in Smart City projects and their contributions were determined. Afterwards, a single case study was carried out to validate the stakeholders and to find their contributions in Smart City projects. Moreover, factors ensuring the engagement of stakeholders, which can be used as strategies were identified through the case study. Captured data from the desktop study and the case study were quantitatively and qualitatively analysed respectively.

In accordance with the findings, a model was developed in order to enable the engagement of stakeholders in the SC projects in Sri Lanka. Government, Local and Regional Administrative Bodies, financial suppliers/ investors, utility suppliers and developers are identified as the internal stakeholders in Smart City projects and Academia and Research Institutions, Media, citizens, non-profit organisations and opposition political parties are identified as the external stakeholders in Smart City projects. Specific contributions and common contributions of each stakeholder were presented in the model. The developed model was validated through an expert survey, which could be utilised to enable the engagement of the stakeholders in Smart City projects in Sri Lanka.

Key Words: Smart Cities, Stakeholders, Engagement, Sri Lanka

DEDICATION

To my beloved parents

ACKNOWLEDGEMENT

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ABBREVIATIONS

CCD - Coast Conservation Department

CEA - Central Environmental Authority

CEB - Ceylon Electricity Board

ICT - Information and Communication Technology

NARA - National Aquatic Resources Research and Development Agency

MEP - Mechanical, Electrical and Plumbing

NGO - Non-Governmental Organisations

RDA - Road Development Authority

SC – Smart City

SCP – Smart City Project

SUD – Sustainable Urban Development

UDA - Urban Development Authority

UDP – Urban Development Project

1.0 INTRODUCTION

1.1 Research Background

A boundless list of expected characteristics in modern cities increases at an amazing pace as the cities become more and more complex every day (Nam & Pardo, 2011). United Nations world population prospects distinguished that the world population will increase between 1950 and 2100 by 8.7 billion people and future population development will be in city areas (Heilig, 2015). Though cities play a major role, they generate complex challenges for Governments by means of uncontrollable expansion and growth, traffic, crime, complicated access to resources and by waste management (Peris-Ortiz, Bennett, & Yábar, 2017). As stated by Schaffers et al. (2011), cities in the present day face multifaceted challenges in accomplishing goals regarding improving the quality of living of the people living in the community and in socio-economic development. With the mounting rate of urbanisation, city areas face the challenge in reaching the target of sustainable development within the cities (Juraschek et al., 2018).

In accordance with Yigitcanlar and Kamruzzaman (2018), Sustainable Urban Development (SUD) is identified as a means of tackling the difficulties caused through wide-ranging activities of the mankind on the environment. Urban sustainability focuses on practical issues such as, emission of carbon, waste management, energy consumption and on the economic viewpoints of urban regeneration and development (Tweed and Sutherland 2007). According to Cervelló-Royo, Garrido-Yserte and García del Río (2012), SUD provides a better internal cohesion. Schaffers et al. (2011) identified the concept of SC as the most ideal solution in achieving SUD. In the fields of urban management, the concept of SC (SC) is identified as an ideological dimension in overcoming the issues in urbanisation because being smarter involves a strategic solution (Albino, Berardi & Dangelico 2015). Therefore, to resolve the complexities created by the urban population growth and rapid urbanization, a growing need to make a city, smart can be identified (Chourabi et al., 2012).

A SC is defined as a connection of the Information and Communication Technology (ICT) infrastructure, social infrastructure, business infrastructure and physical infrastructure enhancing the intelligence of a city (Harrison et al., 2010). Ramaprasad, Sánchez-Ortiz and Syn (2017) identified the concept of smart as a multidisciplinary concept, which consist of technological infrastructure and the capability to manage the data sources and resources in improving the quality of living of the community. According to Bakıcı, Almirall and Wareham (2013), SCs interconnect the community, information and the elements of the city in order to achieve sustainability by means of smartness. With reference to the above mentioned definitions, it can be determined that different aspects of the SC concept are available.

Moreover, concept of 'SC' can be utilised as a strategic device to incorporate the modern urban production factors in a common model (Caragliu, Del Bo, & Nijkamp, 2011). Therefore, SCs have gained a mounting importance in the fields of urban management (Söderström, Paasche, & Klauser, 2014). According to Neirotti, De Marco, Cagliano, Mangano, and Scorrano (2014), the concept of SC gained growing importance because of enhancing the quality of life of the community. Moreover, Batty et al. (2012) also stated that SCs improve competitiveness in a way to improve the quality of life of the people living in the community. Moreover, it was stated that SCs aim to utilise the most advanced ICT in order to assist value added amenities for the management of the city and the community (Zanella, Bui, Castellani, Vangelista, & Zorzi, 2014). Furthermore, as stated by Lazaroiu and Roscia (2012), SC provides an average technology size, interconnectedness, sustainability, comfortability, attractiveness and security for a society. Vanolo (2014) distinguished that SCs create an efficient, green and socially inclusive city, which comprises of technological advancements, which results SUD.

Nam and Pardo (2011) identified technological factors, human factors and institutional factors as the three fundamental components required for the initiation of SCs. Giffinger and Gudrun (2010) recognised that, flexibility, creativity and open-mindedness of human resource create a smart living environment, which directs for SUD. Moreover, Allwinkle and Cruickshank (2011) identified that institutional factors lead for a city to be smart. Lazaroiu and Roscia (2012) identified technological factors

as an important factor in initiating SCs. Human capital was also identified as a main factor required in initiation of SCs (Hollands, 2008). Moreover, Caragliu, Del Bo and Nijkamp (2011) indicated that human capital, education are important drivers for SUD. Hence, it is pivotal to consider all possible dimensions of the SC concept for better initiation.

As stated by Allwinkle and Cruickshank (2011), in the drive of becoming smart, cities will have to face several challenges. According to Schaffers et al. (2011), obtaining resources required, adopting stakeholders, establishment of policies and recognising significances are the most challenging problems encountered in the establishment of SCs. In the conversion of city to SC, Bakıcı, Almirall and Wareham (2013) identified lack of skilled human capital, low level of local entrepreneurship and innovation, lack of project capital funding and global connectivity as challenges. Furthermore, Naphade et al. (2011) mentioned that, extensive coordination, support across multiple functional levels and sponsorship are required in the implementation of smart initiatives within a city. Lack of competence and knowledge of the stakeholders regarding IT infrastructure and technological advancements is also act as a barrier in adopting to SCs (Hernández-Muñoz, et al., 2011). According to Milenković, Rašić, and Vojković (2017), SCs combine technological networks to combine sustainable economic growth while improving the quality of life by the interaction of all stakeholders. Therefore, from the above mentioned challenges it can be identified that, managing stakeholders is important for enabling SCs.

Many researchers have stated the significance of stakeholder management for the success of projects (Yang, Shen, Ho, Drew, & Chan, 2009). Managing the stakeholders was determined as a major action for the accomplishment of the project goals (Eskerod & Huemann, 2013). In accordance with Gemünden (2016), stakeholder management is a concept derived from the view of resource-dependence and moreover, the concept addresses the risks and ethical issues as a major concern in managing the stakeholders of a project. According to Rajablu, Marthandan and Yusoff (2014), the process of project stakeholder management includes the identification of stakeholders, classification of the stakeholders, communication among the stakeholders, engagement, empowerment and risk control. In the process of managing

the stakeholders, engagement of stakeholders is a cornerstone for the success of a project (Abuzeinab & Arif, 2014). For effective engagement of stakeholders, it is essential to have a sound understanding of the stakeholders, who may influence or contribute over the projects' activities (De Bakker & Den Hond, 2008). Bryson (2003) identified stakeholders as groups, persons or organizations who can affect or be affected by the accomplishment of the organization's goals. According to Matuleviciene and Stravinskiene (2015), stakeholders of a project can be categorised as internal and external stakeholders. Olander (2007) defined internal stakeholders as those who actively involved in the execution of the project and external stakeholders are defined as those who are affected by the project. Beringer, Jonas and Kock (2013) distinguished that, internal stakeholders act as a key for projects success. Similarly, the role of external stakeholders was also stated as an important factor for an accomplishment of a project (von Meding, McAllister, Oyedele, & Kelly, 2013).

Mayangsari and Novani (2015) indicated SC as a multi-stakeholder ecosystem, where the stakeholders play a major role. Furthermore, the author stated that transformation of a city to a SC involves the collaboration of political and institutional components with technology, which states the importance of stakeholder management in a SCP in accordance with technological factors, human factors and institutional factors. As stated by Ielite, Olevsky, and Safiulins (2015), stakeholder management in initiating SCs would be key in achieving goals. Effective stakeholder engagement is important to ensure that their activities meet the aims of the SCP for the success of a project (Angelidou, 2014). Therefore, importance of effective engagement of stakeholders can be determined.

Stakeholders of a project include the funding sources of the project, client or suppliers of the project (Winch, 2007). Ielite, Olevsky and Safiulins (2015) identified academia, local and regional administrations, industry and commerce, finance, energy suppliers, Information and Communication Technology (ICT) sector representatives and citizens as stakeholders of SCs. Moreover, Viale Pereira et al. (2017) mentioned that Government agencies and Media are also stakeholders of a SCP. With reference to Mauricio and Mara (2018), Government, research organizations and citizens can be identified as main stakeholders of a SCP. Stakeholders of a project can influence or

contribute for a project. Therefore, it is important to manage the identified stakeholders to gain maximum contribution for the success of a SCP (Anthopoulos & Vakali, 2012). According to Almeida (2017), though there is a requirement for Sri Lankan cities to be smart, there is lack of knowledge, competencies and technology which are required for the initiation of SCs. Therefore, a growing requirement for stakeholder management can be identified and effective stakeholder engagement would enable SCs in Sri Lanka.

1.2   Research Problem Statement

As discussed in the background of the research, a SC has multiple opportunities to enhance its human capacity and lead a resourceful life. Increasing evidence could be identified for SC experiments and implementation through leadership at a city level or at a national level (Chandrasekar, Bajracharya, & O'Hare, 2016). In the drive to become a smart city, cities have to face a major challenge in engaging stakeholders effectively (Angelidou, 2014; Mayangsari & Novani, 2015; Ielite, Olevsky, & Safiulins 2015). As depicted in literature, diverse number of stakeholders involve in SC projects, which represents a multi stakeholder eco system. Challenges arise in smart city projects could be problems associated with multiple diverse stakeholders and their high levels of interdependence (Nam & Pardo, 2011) and the engagement of the stakeholders is identified as a key element to facilitate project success (Abuzeinab & Arif, 2014).

In the Sri Lankan context, the word 'SC' has created a big excitement, after identifying the benefits of SCs, which will bring value to the country, encouragement for sustainable economic development and higher quality of life, with sensible management of natural resources through active Government participation (Zoysa 2015). Currently, few cities including Colombo, Kaluthara, Gampaha, Polonnaruwa and Kandy have been identified to develop as sustainable SCs in Sri Lanka as the first step (Caldera, 2019). Though there is an increasing requirement of SCs in Sri Lanka, lack of appropriate stakeholder engagement in SC projects is a challenge. Therefore, it is important to ensure the engagement of stakeholders in SC projects in Sri Lanka and strategies are required to be developed to ensure the engagement of stakeholders.

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However, only a few research studies in the academic literature have been conducted on challenges in initiating SCs and on ensuring the stakeholder engagement in SC projects. By considering the growing requirement of SCs and the limited number of studies which were carried out on SCs and, the importance of stakeholders towards enabling SCs, the need of studying on the area of stakeholder management for SC projects was identified. With the necessity of having the stakeholder engagement in SC projects in in the selected context, the purpose of this research is intended to enable the engagement of stakeholders in SC projects in Sri Lanka.

Accordingly, the research question is developed as,

"How to engage stakeholders in SCPs in Sri Lanka?"

1.3   Aim and Objectives

The aim of this research is to enable the engagement of stakeholders in Smart City Projects in Sri Lanka.
Following objectives are considered as pillars towards this aim.

1. To review the concepts, characteristics and stakeholder engagement in Smart City Projects for Sustainable Urban Development
2. To investigate the types of stakeholders and their contributions in Smart City Projects in Sri Lanka
3. To develop a model for enabling the engagement of stakeholders in Smart City Projects in Sri Lanka

1.4   Research Methodology

Explanatory sequential mixed method approach was used in achieving the research aim, which is to enable effective engagement of stakeholders in SC projects in Sri Lanka. A comprehensive literature review was carried out initially and subsequently desktop study through newspaper review and a case study were carried out. Findings were analysed using quantitative and qualitative data analysis techniques and finally, a model was developed and validated through an expert survey.

Literature Survey

A comprehensive literature review was conducted to review the concept of "SC", its importance in sustainable urban development and to identify the characteristics of SC projects. Further, the concept of stakeholder engagement and its importance for SC projects were reviewed in literature. Moreover, different stakeholders and their contributions in SC projects were investigated through the literature review.

Desktop Study

A desktop study through a newspaper review for five (5) years was carried out in order to identify the stakeholders and their contributions in urban development projects. SC projects are also considered as urban development projects. As the number of articles regarding SC projects is limited in the Sri Lankan context, articles on urban development projects were reviewed. Findings of the desktop study were analysed quantitatively by deriving percentages from the number of citations in the newspaper articles.

Case Study

Subsequent to the desktop study, a case study was carried out in order to validate the identified stakeholders and their contributions and to investigate on the other stakeholders and their contributions in SC projects in Sri Lanka. Furthermore, factors ensuring the engagement of stakeholders were also identified. Nine (9) Semi structured interviews were carried out to capture data in the case study. Manual content analysis technique was utilised in analysing the findings of the case study.

Model Validation

Through the findings of the study a model was developed in order to achieve the aim of this research. The developed model was validated through an expert survey among five (5) experts in the field.

1.5 Scope and Limitations

The research was limited on developing a model for enabling the engagement of stakeholders in SCPs in Sri Lanka. Data collection from the desktop study was limited to two (2) newspapers for five (5) years due to time constraint. A single case study approach was carried out due to the unavailability of more than one SCPs in Sri Lanka.

1.6 Chapter Breakdown

Figure 1.1 represents the breakdown of chapters in the research. Under Chapter 1, a background survey was conducted and, in Chapter 2 literature review, which was conducted to achieve objective 1 is presented. From data collection and analysis, objectives 2 and 3 were achieved. Conclusions and recommendations will be provided in Chapter 6.
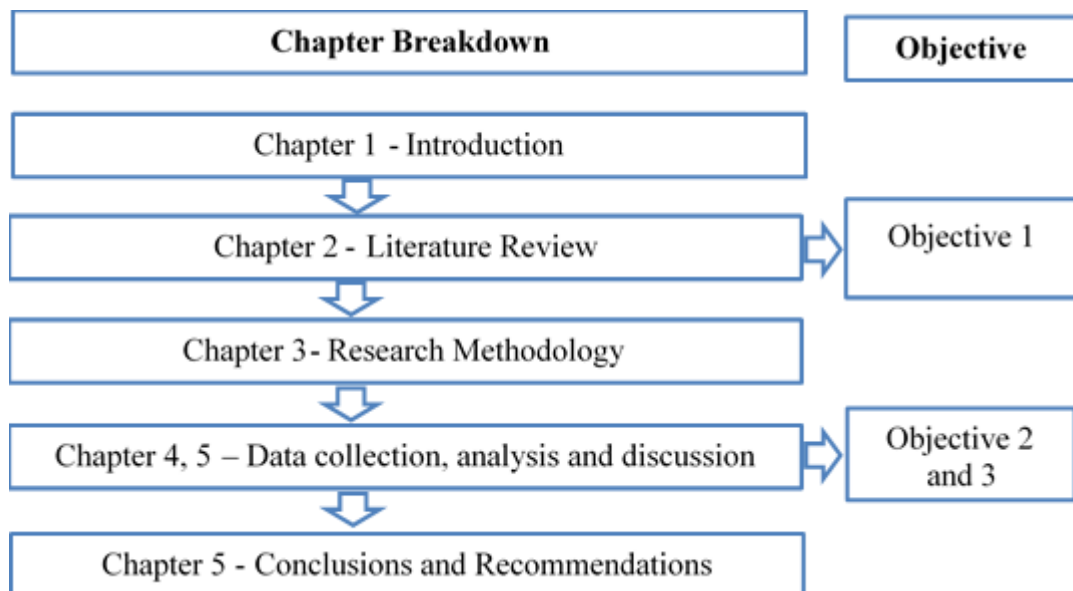
Figure 1.1: Chapter breakdown

1.7   Chapter Summary

The aim of this research is to enable the engagement of stakeholders in SCPs in Sri Lanka. Three objectives were lined up to achieve the aim of the research. A strong background for the research problem is developed through the literature survey. Mixed approach was selected as the research approach. Findings of the desktop study was quantitatively analysed and the findings of the case study was analysed qualitatively.

2.0 LITERATURE REVIEW

2.1 Introduction

In this chapter, a comprehensive literature review on the concept of SCs, importance of SCs for sustainable development, characteristics of SCPs and the importance of stakeholder engagement in SCPs are provided. In the beginning of this chapter, an analysis of the definitions of SCs and the initiative factors of SCs are stated. In order to achieve the aim of this research, stakeholders and their contributions in SCPs are investigated under this chapter. Finally, a conceptual framework enabling the engagement of stakeholders in SCPs is presented.

2.2 The concept of SC

A growing requirement on managing cities can be identified due to rapid urbanisation, technological advancements and because of the increasing awareness and concern regarding the environment (Höjer & Wangel, 2015). As stated by Mori and Christodoulou (2012), cities play a major role in economic, social and environmental aspects. To overcome the complications created by the urban population growth and rapid urbanization, an emerging requirement in adopting to SCs can be identified (Chourabi, et al., 2012).

2.2.1 Definitions of SCs

Governments have given attention to SCs in their research and development projects. Even though, there is no common definition about SCs (Bakıcı, Almirall, & Wareham, 2013). A common definition of a 'SC' has not yet been determined, different authors use various definitions to clarify SCs (Milenković, Rašić, & Vojković, 2017). Figure 2.1 illustrates a comparison of the identified definitions of SCs.

Reference	Definition	Key Words
Ruhlandt (2018)	A multi-dimensional mixture (human, infrastructure, entrepreneurial capital) that are merged, coordinated and integrated using new technologies to "address social, economic and environmental problems involving multi-actor, multi-sector and multi-level perspectives	Multi-dimensional, New technologies
Ramaprasad, Sánchez-Ortiz, and Syn (2017)	"Smart City is a multidisciplinary concept that embodies not only its information technology infrastructure but also its capacity to manage the information and resources to improve the quality of lives of its people" (p.15)	Multidisciplinary concept, Quality of life, Information Technology
Milenković, Rašić, and Vojković (2017)	"Smart city is a city where investments are focused towards smart citizens who use renewable energy resources wisely and widespread technological networks to combine sustainable economic growth whilst improving the quality of life, through the open government model by the interaction of all stakeholders" (p.1412)	Technological network, Sustainable economic growth, Quality of life
Dameri (2013)	"A well-defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of wellbeing, inclusion and participation, environ-mental quality, intelligent development; it is governed by a well-defined pool of subjects, able to state the rules and policy for the city govern-ment and development" (2549)	High technology, Environmental quality, Intelligent development
Bakıcı et al. (2013)	"Smart City implies a high-tech intensive and an advanced city that connects people, information and city elements using new technologies in order to create a sustainable, greener city, competitive and innovative commerce and a recuperating life quality with a straightforward administration and a good maintenance system" (p.139)	People, City elements, New technologies, Sustainable and green city, Life quality
Kourtit and Nijkamp (2012)	Smart cities are "the result of knowledge-intensive and creative strategies aiming at enhancing the socio-economic, ecological, logistic and competitive performance of cities" (p.93)	Socio- economic development
Harrison et al. (2010)	"Connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city" (p.2)	Physical infrastructure, IT infrastructure, Social infrastructure, Business infrastructure

Figure 2.1: Definitions of SCs

From the analysis of Figure 2.1, it can be identified that there are different aspects covered by SCs. In this research SC is defined as,

"SC is a multidisciplinary concept that connects technological factors, human factors and institutional factors in order to achieve a greener city with higher quality of life and sustainable economic growth."

2.2.2 Dimensions of SCs

From the definitions presented in Table 2.1, it was identified that different aspects of SC concept are available. According to Giffinger and Gudrun (2010), there are six success factors of a SC. They are smart economy, smart people, smart governance, smart mobility, smart environment and smart living. Eight success factors of SC initiatives, which are namely management and organization, technology, governance, policy, people and communities, the economy, built infrastructure, and the natural environment can also be identified (Chourabi, et al., 2012). Furthermore, Nam and Pardo (2011) identified that technological factors, human factors and institutional factors as the three fundamental components of SCs. By considering the above mentioned initiative factors, it can be identified that human factors, institutional factors and technological factors are important initiative factors within the SC concept.

Human factors

Clever solutions by creative people is required as an initiative factor in the development of SCs, which results SUD (Nam & Pardo, 2011). A major challenge faced in the beginning of the drive to SCs, is to adapt human resources for the change which can be mitigated by capacity building (Schaffers, et al., 2011). With the current need of SCs, Hollands (2008) also stated that the SCs must seriously start with people and the human capital side. Giffinger and Gudrun (2010) identified that flexibility, creativity, open-mindedness, participation in public life, social cohesion and education as human factors required for a successful SC.

Institutional factors

Governance of the SCs comes under the institutional factors. Institutional infrastructure of a SC integrates public, private, civil, and national organizations to provide interoperation between services which results a more efficient, effective and a reliable service (Kitchin, 2014). Governance is important for the success and growth

of SCs because UD and urban planning is based on governance with multiple stakeholders (Nam & Pardo, 2011). Cooperation, guidance, involvement and partnership, communication, data-exchange, service and application integration, liability, transparency are the factors that affect in smart governance under institutional factors (Chourabi, et al., 2012). Contributing in making decisions, public and social amenities, transparent governance, political strategies and perspectives are the institutional factors stated by Giffinger and Gudrun (2010). Policies of SCs are also important for the initiation of the SC concept because the policies can be used to identify the contribution for SUD (Yigitcanlar & Kamruzzaman, 2018). Furthermore, it was identified that various regulations or accepted norms in their jurisdictions or communities is also important as fundamentals of SCs (Allwinkle & Cruickshank, 2011). Dameri, Negre, and Rosenthal-Sabroux (2016) stated institutional factors as an enabler of SC because it supports interactions and communication amongst all the stakeholders.

Technological factors

Technology is one of the most important enabling factors of a SC (Dameri, Negre, & Rosenthal-Sabroux, 2016). Technological factors play major roles in supporting decision-making, design, planning, development, and management operations of complex urban environments (Yigitcanlar & Kamruzzaman, 2018). SCs use Information and Communication Technologies (ICTs) as a basic strategy in numerous fields such as economy, environment, mobility and governance in order to transform the city infrastructure and services. ICTs have applied a mounting influence on the nature, structure and enactment in urban infrastructure, management, economic activities and in day to day life (Kitchin, 2014). (Inter-) national accessibility, smart mobility and availability of ICT-infrastructure are considered as technological factors by Giffinger and Gudrun (2010).

2.2.3 Fundamentals of SCs

Fundamental factors under each main dimension of smart cities are identified. Ten (10) key research projects in key literature were specifically studied and the initiative factors of SCs concept for SUD were identified. Table 2.1 summarises the review of main and sub factors encountered under the dimensions of SCs. Further, the identified factors are discussed briefly subsequently.

Table 2.1: Review on main and sub factors encountered under the dimensions of SCs

Main and sub factors	Sources									
	1	2	3	4	5	6	7	8	9	10
Human factors					√	√	√			√
Flexibility						√	√			
Creativity						√	√	√		
Open-mindedness						√				
Participation in public life					√				√	
Social cohesion						√				
Education	√			√	√	√	√	√		
Ethnic plurality						√				
Institutional factors		√				√		√		
Governance						√	√	√	√	
Policies						√	√			√
Regulations		√						√		
Accepted norms		√								
Technological factors			√			√	√			√
ICT	√		√	√		√	√	√	√	√
Accessibility			√		√	√	√			
Mobility	√		√			√	√		√	√

Sources: 1. Albino, Berardi and Dangelico (2015); 2. Allwinkle and Cruickshank (2011); 3. Bifulco et al. (2016); 4. Allwinkle and Cruickshank (2011); 5. Chourabi et al. (2012); 6. Giffinger and Gudrun (2010); 7. Lazaroiu and Roscia (2012); 8. Nam and Pardo (2011); 9. Schaffers et al. (2011); 10. Neirotti et al. (2014)

Human factors

Caragliu, Del Bo and Nijkamp (2011) stated that human capital, education are important drivers for UD. Allwinkle and Cruickshank (2011) also stated that education of the community initiates SUD, which leads to SCs. Flexibility, creativity and open mindedness creates a smart living environment, which directs for SUD (Giffinger &

Gudrun, 2010). Moreover, it was stated that ethnic plurality and education will create a link within the city which will be an initiative for SCs.

Institutional factors

Allwinkle and Cruickshank (2011) identified that norms, regulations link members in the community and leads for a city to be smart. Governance, policies and regulations enables and directs the citizens to act sustainably (Nam & Pardo, 2011). Therefore, for SUD, institutional factors play a major role. Chourabi et al. (2012) also stated that good governance can lead and guide a city to be smart, which is a strategy for SUD. Furthermore, Lazaroiu and Roscia (2012) revealed about the importance of smart governance in the path for a city to be smart.

Technological factors

Smart technology is determined as a key in the accomplishment of the goals related in design, implementation, and operation phases in SC development (Mohanty, Choppali, & Kougianos, 2016). As stated by Albino, Berardi and Dangelico (2015), high-quality and more efficient public transport are considered a key element for SUD. Authors further stated that novel approaches related in urban services are based on harnessing technologies, including ICT, result in sustainable city development. However it was revealed that ICT should be taken as an approach to enhance the quality of life. Bifulco, Tregua, Amitrano and D'Auria (2016) also identified that ICT applications, transportation systems and mobile devices allow the citizens to involve and contribute to their UD to be sustainable.

Accordingly, Figure 2.2 was developed graphically represent the factors and sub factors of the initiation of SCs concept identified through the literature review.
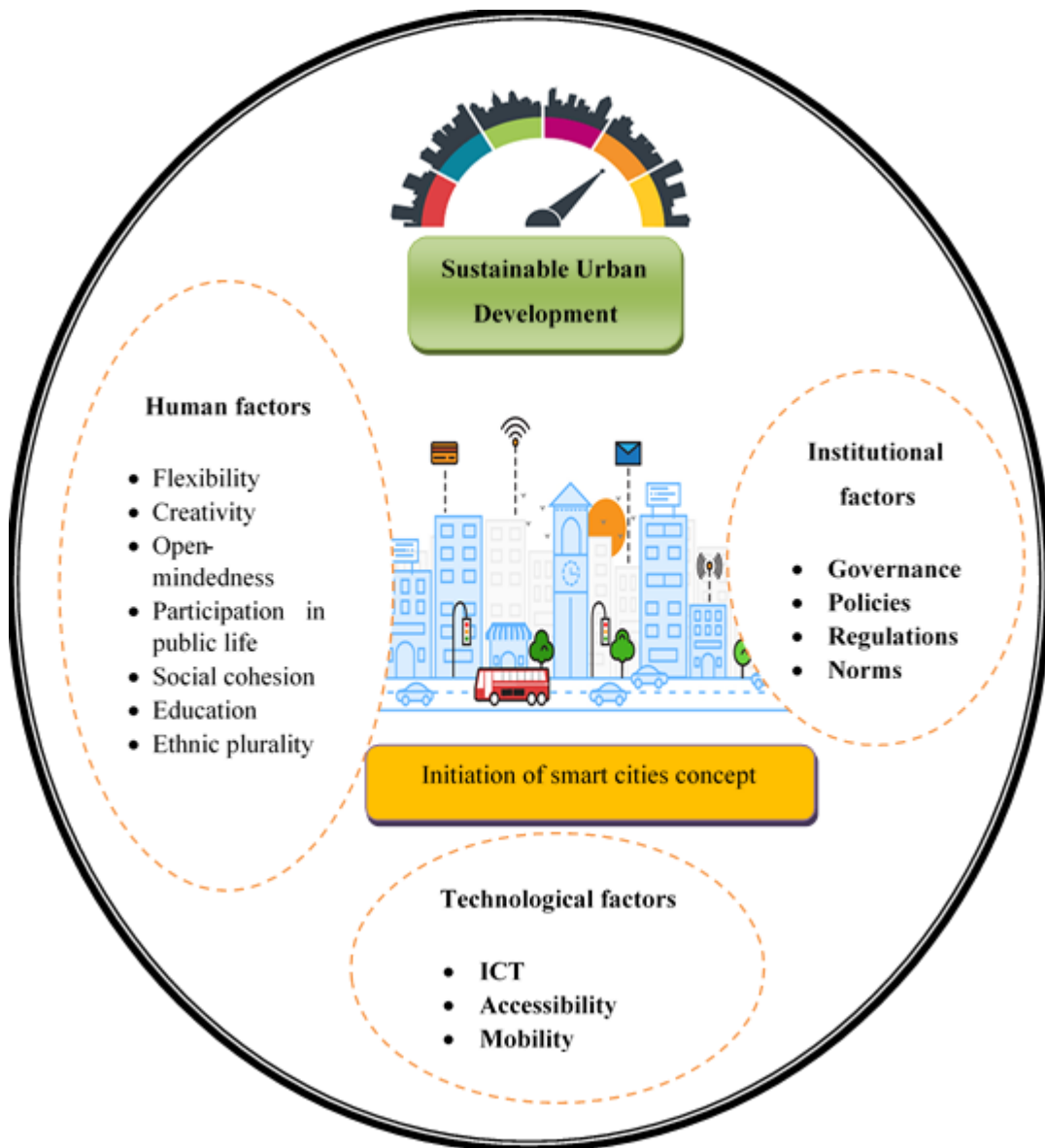
Figure 2.2: Factors and sub factors of the initiation of SCs

2.2.4   Models of SCs

As stated by Angelidou (2014), SCs symbolise an UD model based on the utilization of human factors, institutional factors and technological factors to overcome the challenges regarding urbanisation.

Zygiaris (2013) illustrated a SC conceptual reference model which is presented in Figure 2.3. According to this model, city is the basis of a SC where the other layers of the model presents the requirements to be fulfilled in developing a SC.
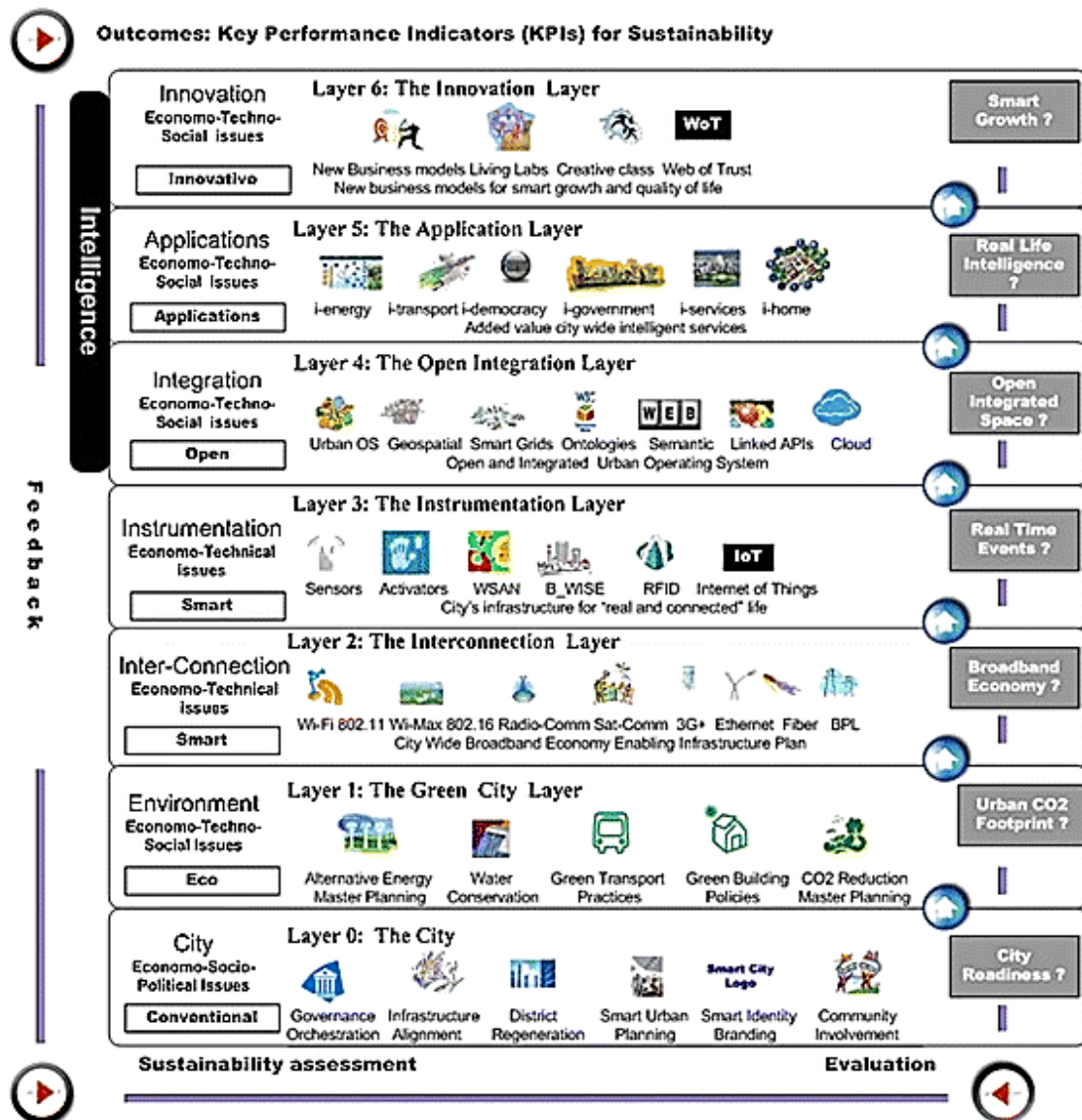
Figure 2.3: SC conceptual reference model

Source: Zygiaris (2013)

Fernandez-Anez, Fernández-Güell, and Giffinger (2018), presented a conceptual model of SCs as Figure 2.4. This SC model represents seven layers, where there are various stakeholders and urban subsystems in relation to the different SC dimensions and initiatives.
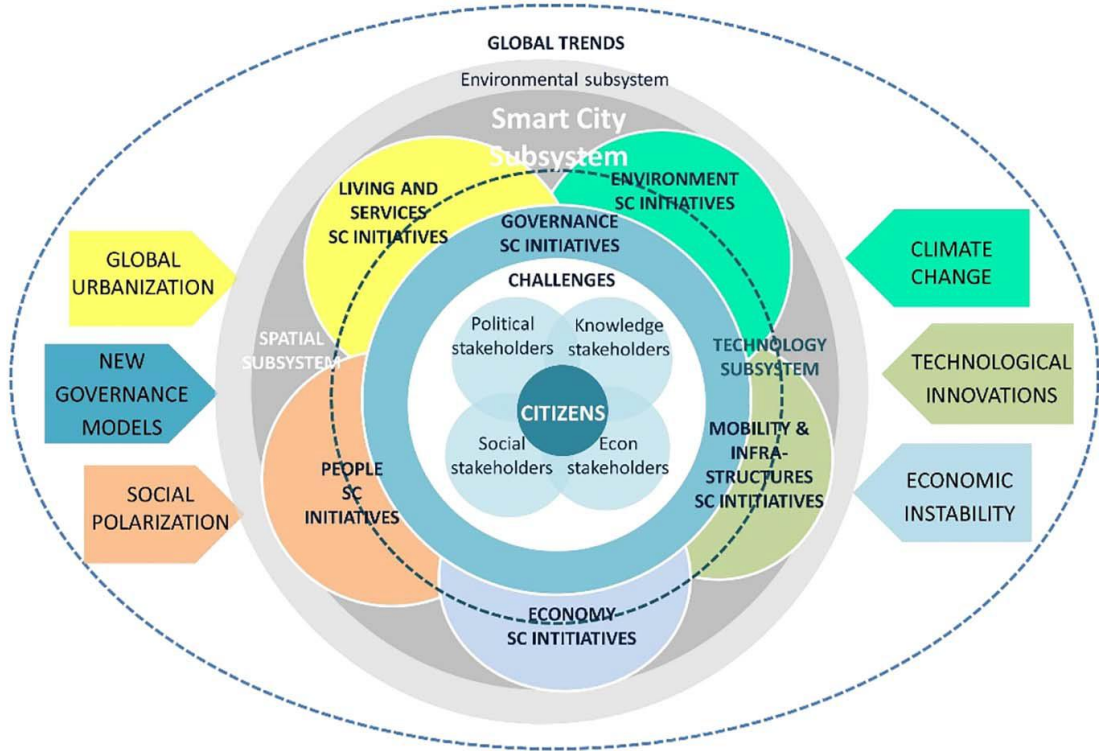
Figure 2.4: Conceptual model of SCs

Lim, Kim, and Maglio (2018) presented a hierarchical structure of application areas related to SCs. This structure is presented in Figure 2.5. In this model, dimensions to be developed in adopting for SCs is illustrated.
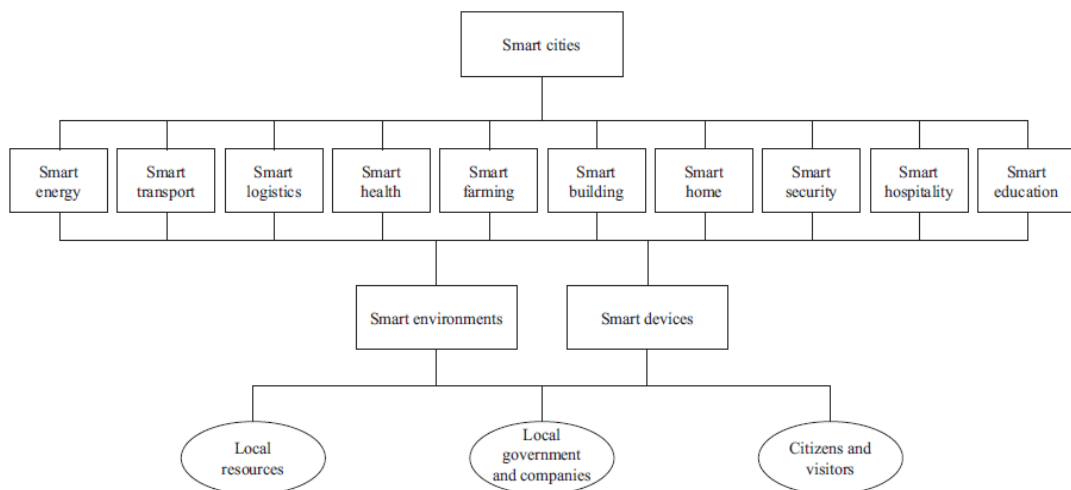
Figure 2.5: Hierarchical structure of application areas related to SCs

Source: (Lim, Kim, & Maglio, 2018)

2.2.5 Characteristics of SCPs

In present context, many initiatives are being developed aiming the analysis of the initiation, deployment and outcomes of SCPs. However, it was identified that there is a shortage of standardised methodologies in assessing, prioritizing, financing, implementing, managing and replicating SCPs (Monzon, 2015). As stated by Monzon (2015), SC development projects are encouraging reflections, ideas, researches and projects for a "smart" UD. According to Mohanty, Choppali and Kougianos (2016), SC can be monitored, managed and regulated by utilising technological advancements. SCPs emerge the requirement of service planning and adequate infrastructure development (Kumar, Singh, Gupta, & Madaan, 2018).

Urban planners and service providers view the requirements of the citizens in SCPs for a better effect in SC development (Lee & Lee, 2014; Kumar, Singh, Gupta, & Madaan, 2018). Moreover to Kumar, Singh, Gupta and Madaan (2018), transformation of a city to a SC require a systematic study for strategic and integrated planning to design SC services. Furthermore, Mohanty, Choppali, and Kougianos (2016) identified sustainability, quality of life, urbanisation by means of smartness as the main attributes of SCs. According to Schipper and Silvius (2018), realising strategic change, considering all triple bottom line perspectives are characteristics of a SC development project. Moreover to the author, SC development projects manage stakeholders in a structured process dealing with constraints, resources, uncertainty and complexity than the other UDPs.

2.3 SC concept for SUD

Economic growth and industrialization have stimulated rapid urbanization. With reference to Jago-on, et al. (2009), rapid economic growth has been advantageous to the cities as they have become centres of education, commerce, production and governance. However, it has also created environmental problems, in air and water quality, decreasing water supply, insufficient housing and sanitation facilities, traffic congestion and increasing solid waste. Rapid increase of urbanization is an opportunity

as well as a challenge to the country's effort in achieving SUD (Henderson, Quigley, & Lim, 2009).

2.3.1 Definitions of SUD

Urbanisation increases the consumption of resources and in related emission, which is an issue for sustainable development (Barles, 2010). Sustainable development is one the main challenges in urban areas (Juraschek, et al., 2018). Therefore, UDPs aim sustainable development as a stated goal (Dale & Newman, 2009). SUD has become a key target due to rapid urbanisation and because of social, environmental, and economic problems in cities (Hassan & Lee, 2015). As stated by Kagan, Hauerwaas, Holz and Wedler (2017), different definitions and criteria are available for SUD depending on the population growth and on the requirements of sustainability. Definitions of SUD are presented in Figure 2.6.

Reference	Definition	Key Words
Bibri and Krogstie (2017)	"Achieving a balance between the development of and equity in the urban areas and the protection of the urban environment" (p.189)	Balance Protection of the environment
Maclaren (as cited in Hassan & Lee, 2015)	Strategies and processes that drive the progress in the field of sustainability within urban areas	Strategies Sustainability
Li et al. (2009)	"Economic growth and efficiency, ecological and infrastructural construction, environmental protection and social and welfare progress" (p.134)	Economic growth Environmental protection Social and welfare progress
Brindley (2003)	"Revalidation of urban living, in contrast with the geographically dispersed city and the high levels of personal mobility that have increasingly become the norm"(p.53)	Revalidation Urban living

Figure 2.6: Definitions of SUD

Through the analysis of the definitions presented in Figure 2.6, the following definition for SUD is developed. In this research, SUD is defined as,

"Achieving a balance between UD with economic growth, efficiency, environmental protection and with social and welfare progress".

2.3.2 Achieving sustainability in Urban Development

Growing challenges for sustainable development within cities initiated the requirement of SUD (Bibri & Krogstie, 2017). In recent years, sustainable development is a widely used term, which has an influence on urban planning and development (Dempsey, Bramley, Power, & Brown, 2011). Moreover, ongoing concentration of the worldwide population in city-based areas, implies the increasing importance of addressing the problems regarding sustainable development (Höjer & Wangel, 2015). Leaders are required to investigate on the new strategies to enhance the performance of a city because cities face challenges regarding to growth, performance and sustainability (Letaifa, 2015). Jepson Jr and Edwards (2010) stated new urbanism, smart growth and the ecological city as solutions to achieve SUD. According to Petrova and Nenko (2018), urban emptiness is a multidimensional perception that supports asemantic, time-based, material and social dimensions of the city and is an internal resource, which can be identified as a significant strategy in achieving SUD.

In adopting for SUD, a huge challenge is to assess the current state of the city and assess progress of the city towards desired goal (Keirstead & Leach, 2008). Frameworks assessing the urban sustainability, based on the performance requirements were developed with the increasing importance of SUD practices in the field of urban management (Angelidou, et al., 2017). Verma and Raghubanshi (2018) stated that suitable sustainability indicators are required to quantify SUD. Moreover, Keirstead and Leach (2008) also stated the importance of urban sustainability indicators to achieve SUD. Therefore, it can be identified that urban sustainability assessment frameworks are important in achieving sustainability in UD.

Angelidou, et al. (2017) identified SC as an approach for SUD. Recently, the theory of SC has become vital in urban management because, the local authorities face challenges in resolving the issues generated in relation to climatic, energy and

urbanisation (Sikora-Fernandez, 2018). Furthermore, Nilssen (2018) also stated that SC is becoming an increasingly popular focus in achieving SUD.

2.3.3 Importance of SCs for SUD

As stated by Lazaroiu and Roscia (2012), SC represents a society, which consist of average technology size, interconnectedness, sustainability, comfortability, attractiveness and security. Many cities, face the challenge of achieving SUD with the overexploitation of resources, inadequate number of services and with increase in pollution due to rapid population growth (Bifulco, Tregua, Amitrano, & D'Auria, 2016). The concept of SC has gained increasing importance because of the improvement of the quality of life of citizens attained through SCs (Neirotti, De Marco, Cagliano, Mangano, & Scorrano, 2014). According to the authors, SCs are identified as a strategic device to integrate modern urban production factors in a common model.

SCs are important in having a healthier environment, better social and enhanced economic conditions and in improving the attraction and competitiveness (Trindade, et al., 2017). According to Hashem, et al. (2016), SCs play a key role in enhancing human life, transportation, health, energy and education. SC concept is a multidisciplinary subject of interest required for sustainability in UD, economic growth and in Urban technology (Angelidou, 2017). SCs provide solutions for the most irresistible issues facing by urban communities due to the issues related to the environmental impact of human activities and possible decreases in health and quality of life (Bello, Mydlarz, & Salamon, 2018).

In urban planning, SCs are identified as the most ideal solution in resolving the challenges generated through rapid urbanisation (Albino, Berardi, & Dangelico, 2015). According to Juraschek, et al. (2018), all elements of cities are required to contribute to SUD. Bello, Mydlarz, and Salamon (2018) mentioned that, initiating SCs benefits in intelligent sensing, widespread connectivity and drive effective action, which is important for SUD. Moreover, Zhang, Bayulken, Skitmore, Lu, and Huisingh (2017) also stated the importance of SCs for achieving urban sustainability to gain a sustainable and healthy future.

2.3.4 Enablers and barriers for developing SCs

SCPs require various supports from municipalities and SCs run in partnerships with funding from subsidies (van Winden & van den Buuse, 2017). The need for policy changes, limited capital availability, political uncertainties and disorganised funding structures prevent investment in initiating SCs (Vilajosana, et al., 2013). Scuotto, Ferraris, and Bresciani (2016) mentioned that, building knowledge and creating relationships with external stakeholders is a barrier in initiating SCs. Initiating SCs require consideration of the stakeholders who need to be involved in the planning and governance of the city. Hence, it is also considered as a barrier for adopting SCs (Houghton, Miller, & Foth, 2014; Höjer & Wangel, 2015). Furthermore, modelling, understanding, and influencing human behaviour, and creating trust in technologies act as key challenges (Naphade, Banavar, Harrison, Paraszczak, & Morris, 2011). Technology, actors, policies, goals, vision and governance are identified as drivers of SC development (Dameri, 2013). Moreover to Dameri (2013), the main driver for SC birth and development is technology. Anttiroiko, et al. (2014) also identified the importance of smart use of ICTs as a driver in initiating SCs. Physical capital, natural capital, social capital and digital capital are the drivers of SCs identified by Abdoullaev (2011). VanWinden and Van Den Buuse (2017) stated that, SCPs require support from municipalities and run in partnerships with funding from subsidies. Table 2.2 summarises the key drivers encountered in key literature.

Table 2.2: Drivers in initiating SCs.

Drivers	1	2	3	4	5
Technology	√	√	√	√	
Stakeholders	√		√		√
Policies	√				√
Governance	√		√	√	√
Required funding		√		√	√
Goals and vision	√				

Sources: 1. Dameri (2013); 2. Anttiroiko, et al. (2014); 3. Abdoullaev (2011); 4. VanWinden and Van Den Buuse (2017); 5. Chourabi, et al., 2012

Elmangoush, et al. (2013) highlighted the requirement of knowledge and competence in initiating SCs. The need for policy changes, limited capital availability, political uncertainties and disorganized funding structures prevent in-vestment in initiating SCs (Vilajosana, et al., 2013). Scuotto, et al. (2016) mentioned that, building knowledge and creating relationships with external stakeholders is a barrier in initiating SCs. Initiating SCs require consideration of the stakeholders who need to be involved in the planning and governance of the city. Hence, it is also considered as a barrier for adopting SCs (Höjer & Wangel, 2015). Furthermore, modelling, understanding, and influencing human behaviour, and creating trust in technologies act as key challenges (Naphade, et al., 2011). Bakıcı, et al. (2013) identified lack of skilled human capital, funding and global connectivity as barriers in a SC development project. Table 2.3 summarises the barriers in initiating SCs.

Table 2.3: Barriers in initiating SCs

Barriers	1	2	3	4	5	6
Lack of technology	√				√	
Lack of knowledge and competence	√	√		√		√
Limited capital availability			√			√
Political uncertainties			√	√	√	
Disorganised funding structures	√		√			
Creating relationships with stakeholders		√	√	√	√	√
Sources: 1. Hernández-Muñoz, et al. (2011); 2. Elmangoush, et al. (2013); 3. Vilajosana, et al. (2013); 4Scuotto, et al. (2016); 5. Höjer and Wangel (2015); 6. Bakıcı, et al. (2013)						

According to Hernández-Muñoz, et al. (2011), lack of ICT infrastructure and knowledge related for technological advancement is a challenge in adopting SCs. ICT is identified as an enabler in the transformation of traditional cities into SCs (Mohanty, Choppali, & Kougianos, 2016). Furthermore, Elmangoush, Coskun, Wahle, and Magedanz (2013) also highlighted the requirement of knowledge and competence in initiating SCs. Bakıcı, Almirall, and Wareham (2013) identified lack of skilled human capital, funding and global connectivity as challenges in a SC development project.

By considering the above literature it can be identified that most of the barriers are due to improper stakeholder management.

2.4   Stakeholder Engagement

Stakeholder management is identified as an essential element for project success. Identification and classification of stakeholders is significant before planning to engage the stakeholders (Rajablu, Marthandan, & Yusoff, 2014). Stakeholder analysis is carried out for the methodical identification of stakeholders, the assessment of the stakeholders and for the comparison of stakeholders' particular sets of interests, roles and powers, and the consideration and investigation of the relationships between them (Raum, 2018). Engaging all stakeholders in a project is a key in achieving the goal of a project (Greenwood, 2007).

2.4.1   Definitions of stakeholders

Stakeholders play a major role in the attainment of the tasks in a project (Karlsen, 2002). Many published definitions on the concept of stakeholder has been identified, though theree is no common agreement as to what the concept of a stakeholder means (Miles, 2012). Eskerod and Huemann (2013) have also stated that there are several definitions of stakeholders. Wagner M, Alves, and Raposo (2011) revealed that, the definition of stakeholders is important for the management of stakeholders. Figure 2.7 represents the definitions of stakeholders. In analysing Figure 2.7, it can be determined that the definitions of stakeholders have not been significantly transformed.

2.4.2   Types of stakeholders of a project

Mainly two (2) categories of stakeholders can be identified as internal and external stakeholders depending on the viewpoint of the observer (Sutterfield, Friday-Stroud, & Shivers-Blackwell, 2006). According to von Meding, McAllister, Oyedele and Kelly (2013), stakeholders with active participation are described as internal and the stakeholders outside the main processes of a project are identified as external stakeholders. Matuleviciene and Stravinskiene (2015) identified internal stakeholders as stakeholders, who are concerned on the commercial actions and productivity.

Furthermore, stakeholders are being categorised as primary and secondary stakeholders (Kim, Kim, Marshall, & Afzali, 2018). According to Kim, Kim, Marshall and Afzali (2018), primary stakeholders are identified as those who are critical by means of the projects, or organisational activities. Secondary stakeholders are those, who are not essential to be considered in the organisational or project activities, but nevertheless cannot be ignored in the execution of the activity.

Reference	Definition	Key Words
Rose (2013)	"Individual, group, or organization who may affect, be affected by, or perceived itself to be affected by a decision, activity or outcome of a project" (p.451)	Individual, Group, Affect, Affected, outcome
Olander (2007)	Representatives of the interested parties who can affect a project positively or negatively are referred to as the project's stakeholders	Interested parties, Positively, negatively
Sutterfield, Friday-Stroud, and Shivers-Blackwell (2006)	"Any individual or group of individuals that are directly or indirectly impacted by an entity or a task" (p.27)	Individual, Group, Directly, Indirectly
Smith, Love, and Wyatt, (2001)	"Stakeholders are representatives, direct and indirect, who may have an interest and can make a contribution to the proposed project"	Representatives, Direct, Indirect
Garavan (1995)	"groups who are vital to the survival and success of the business/function" (p.11)	success
Freeman and Reed (1983)	any group or individual who can affect or is affected by the business/function	Group, Individual, Affect, Affected

Figure 2.7: Definitions of stakeholders

Stakeholders of societal challenges may include National, local and regional governing bodies, International organisations, non-Governmental organisations, private sector and corporate sector, community and academia and research institutions (Ginige, Amaratunga, & Haigh, 2018). Stakeholders in adopting for environmental

management practices are identified as businesses, Governments, Government agencies, national/international regulators, academia and community (Karimi & Rahim, 2015). Managing these stakeholders enable the expected outcome of a project (Karlsen, 2002).

In accordance with the findings presented on the types of stakeholders, in this research the classification of the stakeholders is done as internal and external stakeholders based on the characteristics of internal and external stakeholders. Characteristics of internal and external stakeholders are presented in Figure 2.8.

Characteristics of internal stakeholders

- Active involvement in the project (von Meding, McAllister, Oyedele & Kelly, 2013)
- Interested in the financial activities and efficiency (Matuleviciene & Stravinskiene, 2015)
- Formally connected with the project (Gibson, 2000)
- Important with regard to the project's economic interests, such as suppliers, sponsors, and customers (Aaltonen, 2011)
- Have overall managerial responsibility and power (Ward & Chapman, 2008)
- Have a contractual relationship with the project owner

Characteristics of external stakeholders

- Outside the main operations of a project (von Meding, McAllister, Oyedele & Kelly, 2013)
- Interested in the value and quality (Matuleviciene & Stravinskiene, 2015)
- Not formal members of the project coalition (Gibson, 2000)
- May affect or be affected by the project
- Influence the project through political lobbying, regulation and campaigning
- Directing actions without direct involvement

Figure 2.8: Characteristics of internal and external stakeholders

2.4.3 Definitions of Stakeholder Management

Stakeholder management was identified as a core activity for creating project success (Eskerod & Huemann, 2013). Handling different set of stakeholders across different levels is identified as a challenge, which can be overcome by stakeholder management (Sunder M, 2016). It is essential to conduct the management of stakeholders to become aware about the projects' stakeholders and to ensure the balance between contribution and reward (Karlsen, 2002). For effective management of the stakeholders, it is required to identify the stakes of the stakeholders regarding the project (Sutterfield, Friday-Stroud, & Shivers-Blackwell, 2006). Figure 2.9 illustrates definitions of stakeholder management identified in key literature.

Reference	Definition	Key Words
Amoatey and Hayibor (2017)	"A process by which an individual establishes and maintains support from internal staff members and external parties for a new product or project or change within the organization" (p.6).	Process
von Meding, McAllister, Oyedele and Kelly (2013)	Understanding the nature of the relationships between the stakeholders and utilising the stakeholders in order to achieve a common goal	Understanding interelationships
Wagner, Alves, and Raposo (2012)	Recognising, analysing and examining the individual and group characteristics that influence or are influenced by the project or organisational behaviours and actions	Recognising, Analysing, Examining
Boesso (2009)	"Complex mix of different strategic tasks that include identifying, assessing, prioritizing, managing the relationship, communicating, negotiating, and contracting with various entities that may have relevance to the firm's economic interest" (p.65)	Identifying, Assessing, prioritising, managing, communicating, contracting

Figure 2.9: Definitions of stakeholder management

According to the findings presented in Figure 2.9, stakeholder management can be identified as a process, where all the stakeholders are managed in order to achieve a common goal. Stakeholder management can be determined a key success factor of a project.

2.4.4 Stakeholder management process

According to Rajablu, Marthandan, and Yusoff (2014), project stakeholder management includes the identification of stakeholders, classification of the stakeholders, communication, engagement of the stakeholders, empowerment, and risk control. Xia, Zou, Griffin, Wang, and Zhong (2018) identified collecting stakeholder-related document and making stakeholder management planning, stakeholder identification and categorisation, stakeholder analysis and evaluation, stakeholder response and stakeholder control as the steps involved in the stakeholder management process. Identify, prioritise, visualise, engage, and monitor are the steps of the stakeholder management process stated by (Bourne, 2008).

Identification of all stakeholders of a project is important to achieve the goal of project because the stakeholders are play a key role for the success of a project (Parent & Deephouse, 2007; Crane & Ruebottom, 2011). To manage different stakeholders different strategies shall be used according the priority of the stakeholders (Kolk & Pinkse, 2006). Prioritization of stakeholders is identified as the second step of stakeholder management and as a key for value creation as effective stakeholder management strategies can be developed according to the priority (Hall, Millo, & Barman, 2015). According to Mitchell, Agle and Wood (1997), classification of stakeholders can be carried out according to the power to influence, legitimacy of the stakeholder's relationship and the urgency of the stakeholder's claim (as cited in Aragonés-Beltrán, García-Melón, & Montesinos-Valera, 2017). Novoa, et al. (2018) stated that the potential to influence the project and the impact for the project is considered in stakeholder prioritisation. Figure 2.10 illustrates the categorisation of stakeholders according to the above mentioned criteria.

Subsequently to prioritisation, communication with each stakeholder should be carried out according to the priority of the stakeholders (Rajablu, Marthandan, & Yusoff, 2014). Stakeholder engagement is a practice to involve stakeholders in a positive manner in the activities of a project for the success of a project (Greenwood, 2007). After stakeholder engagement, monitoring should be carried out for the enhancement of stakeholder management (Bourne, 2008).
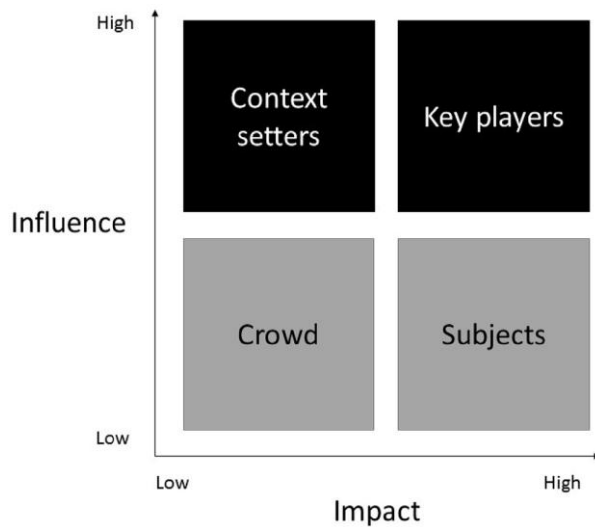
Figure 2.10: Categorisation of stakeholders
Source: Novoa, et al. (2018)

2.4.5 Stakeholder Engagement

Stakeholder engagement is to inform, consult, involve, collaborate with, and empower affected people involved in decision making (Sam, Coulon, & Prpich, 2017). Therefore, stakeholder engagement is considered as one of the key elements to facilitate project success (Abuzeinab & Arif, 2014). Stephenson, Lohmann, and Spasojevic (2018) stated that the identification and prioritisation of stakeholders enable the best engagement of the stakeholders. Meaningful, accessible and culturally appropriate methods for stakeholder engagement must be utilized for the best outcome of a project (Ramirez-Andreotta, Brusseau, Artiola, Maier, & Gandolfi, 2014). Stakeholder engagement approaches, may include their strengths and weaknesses, and be able to use effectively and cautiously (Chinyio & Olomolaiye, 2009). According to Novoa, et al. (2018), Chinyio and Olomolaiye (2009) and Nwachukwu, Udeaja, Chileshe, and Okere (2017), stakeholder engagement process include the steps, which are presented in Figure 2.12.
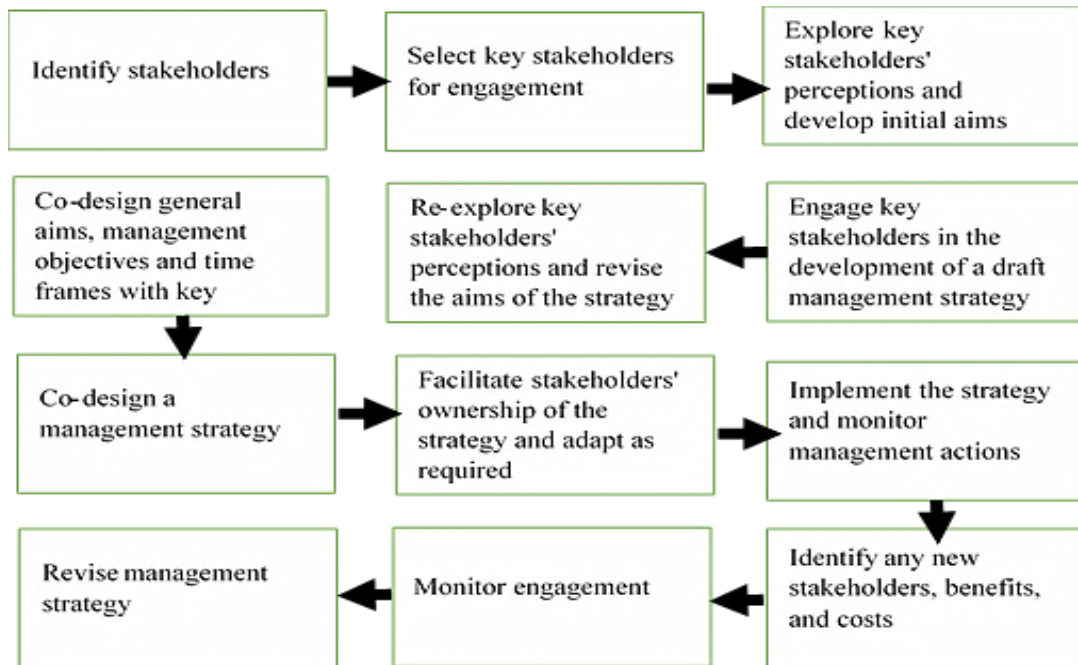
Figure 2.11: Stakeholder engagement process

2.5   Stakeholder engagement in SCPs

Subsequent sections present the importance of stakeholder engagement in SCPs and the stakeholders in SCPs.

2.5.1   Importance of stakeholder engagement for SCPs

In the drive of becoming a SC, challenges, which arise could be the problems related to the multiple diversity of stakeholders involved in the project, high levels of inter-relationships of the stakeholders, opposing values and social and political complications (Nam & Pardo, 2011). SCPs require collaborative efforts of the stakeholders in order to overcome the challenges in improving the quality of life. (Anthopoulos & Tsoukalas, 2005; Puron-Cid, Gil-Garcia, & Zhang, 2015). Ielite, Olevsky and Safiulins (2015) identified stakeholder management as an important factor in initiating SCPs. It is identified as important to ensure the engagement of the stakeholders in order to attain the required contribution for the success of the project (Angelidou, 2014).

Many cities have started a numerous number of pilot SCPs, in which different stakeholders involve to overcome the current urban challenges (van Winden & van den Buuse, 2017). If the project stakeholders are not managed in a standardised manner, unexpected complex issues and uncertainty of the project will arise because of the problems with stakeholders (Karlsen, 2002). Therefore, it is essential to identify the stakeholders in order to plan and carry out a sufficient stakeholder management process (Olander, 2007). Attracting and accomplishing projects requires a number of partners work together (Dietrich, Eskerod, Dalcher, & Sandhawalia, 2010). Moreover, Caragliu and Del Bo (2018) stated the importance stakeholder involvement for SC policies and practices for SCP success.

2.5.2 Types of stakeholders in SCPs

It is essential to have a good understanding on the stakeholders, who might contribute or effect the development of the projects (De Bakker & Den Hond, 2008). Moreover to De Bakker and Den Hond (2008), categorisation of the stakeholders in accordance with the analysis guides in management in handling with stakeholder requirements and in increasing the contribution from the stakeholders. Stakeholders of a SC development project helps in achieving the goal of implementation of SCs (Kondepudi & Kondepudi, 2015). Table 2.3 presents a review on the stakeholders of a SCP in fourteen (14) key research projects and the contributions of each stakeholder is discussed briefly in this section.

Academia and Research Institutions

As stated by Ielite, Olevsky and Safiulins (2015), in the initiation of the SCPs, academic institutions are responsible in contributing the projects through academic research. As a result of the mounting interest of the research institutes regarding SCs, numerous number of pilot SCPs have been started in the present context. (van Winden & van den Buuse, 2017). Creating solutions for the problems generated in certain areas in a SCP could be guided from the academia (Larios, Gomez, Mora, Maciel, & Villanueva-Rosales, 2016). Furthermore, introduction of the terms and definitions related in the development of SCs is being carried out by the Academia and Research Institutions (Lara, Da Costa, Furlani, & Yigitcanla, 2016). According to Kitchin

(2015), academia is working on developing smart technologies and policy formulations. In recent years, academia is focusing on exploiting the advances in sensing, communication and dynamic adaptive technologies (Djahel, Doolan, Muntean, & Murphy, 2015). In the planning phase of SCPs, experts in the fields are also required to be involved for ta better outcome of the project (Stratigea, Papadopoulou, & Panagiotopoulou, 2015). Moreover to Stratigea, Papadopoulou and Panagiotopoulou (2015), scientists and experts are important in the innovation processes in a SC. Accordingly, initiating, providing solutions, innovation of new technologies, guide in policy formulation and involve in planning of the project were identified as the contributions of Academia and Research Institutions in SCPs.

Table 2.3: Stakeholders in SCPs

Stakeholders of SC projects	Sources of references													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Academia and Research Institutions	√	√			√	√	√	√	√	√	√	√		√
Local and regional administrations	√			√		√			√		√		√	√
Financial suppliers/Investors	√		√				√							
Energy suppliers	√					√							√	
ICT sector representatives	√	√		√	√	√	√	√	√		√			
Citizens	√	√	√	√	√	√	√	√	√	√			√	√
Government		√	√		√	√		√	√	√	√		√	√
Developers		√									√	√		
Non-profit organisations				√		√	√							
Urban Planners					√							√	√	
Policy makers		√	√		√	√		√				√	√	
Political Institutions							√		√	√	√			
Media		√			√	√		√		√				√
Sources: 1. Ielite, Olevsky, and Safiulins (2015); 2. Angelidou (2014); 3. Kondepudi and Kondepudi (2015); 4. Nam and Pardo (2011); 5. Stratigea, Papadopoulou, and Panagiotopoulou (2015); 6. van Winden and van den Buuse (2017); 7. Ferna ndez-Anez, Ve lazquez-Romera, and Perez-Prada (2016); 8. Schaffers, et al. (2011); 9. Dameri, Negre, and Rosenthal-Sabroux (2016); 10. Ardito, Ferraris, Petruzzelli, Bresciani, and Del Giudice (2018); 11. Larios, Gomez, Mora, Maciel and Villanueva-Rosales (2016); 12. Tiwari and Jain (2014); 13. Kumar, Singh, Gupta and Madaan (2018); 14. Kitchin (2015)														

Local and regional administrations

The active involvement of local and regional administrative bodies are vital in initiating, promoting and supporting SCPs because SCPs necessitate improved public infrastructure and services (van Winden & van den Buuse, 2017). Nam and Pardo (2011) stated managing resources in SCPs as an important contribution of the administrations. Local and regional administrations positively endorse the SC development because of the sustainability, security and healthy existence of the community in SCs (Kitchin, 2015). Therefore, initiating, promoting the project, managing resources and monitoring sustainability and security are identified as contribution of local and regional administrations in SCPs.

Financial suppliers/Investors

SCs are very expensive to implement and also to operate (Kondepudi & Kondepudi, 2015). Therefore, a strong dependency on the financial suppliers can be identified. Obtaining funding is key for the development of SCPs and the investors mainly consider the return on investment of the project (Ferna ndez-Anez, Ve lazquez-Romera, & Perez-Prada, 2016). Therefore, funding is identified as the contribution of financial suppliers/ investors in SCPs.

Energy suppliers

In the SCPs, SUD is identified as an important concern. Therefore, a requirement in sustainable energy supply can be identified for the day today operations of the SC (van Winden & van den Buuse, 2017). Ielite, Olevsky and Safiulins (2015) stated that policies regarding the sustainable energy supply for SCs plays a major role. Accordingly, supporting sustainability is the key contribution of energy suppliers identified, in SCPs.

ICT sector representatives

In the initiation of SCPs and in the functioning stage of SCs, technological factors and advancements are identified as vital requirements (Nam & Pardo, 2011). According to Stratigea, Papadopoulou and Panagiotopoulou (2015), ICT sector representatives are

contributing could contribute in SCPs in numerous ways. ICT sector representatives should develop the necessary ICT facilities for improving public participation in the SC development project (Granier & Kudo, 2016). According to Muhlberger, Stromer-Galley and Webb (2011), ICT enable and widen the public of participation for the project. ICT initiatives could attribute for rapid adaptation for SCs (Puron-Cid, Gil-Garcia, & Zhang, 2015). ICT sector representatives lead in developing functional management tools in areas such as transport, energy, health care, water and waste (Angelidou, 2015). Accordingly, developing the required ICT facilities for improving public participation and developing functional management tools are contributions of ICT sector representatives in SCPs.

Citizens

According to Kinawy, El-Diraby, and Konomi (2018), citizens are increasingly interested to be engaged in project decision making. Stratigea, Papadopoulou and Panagiotopoulou (2015) identified citizens as a major stakeholder in a SCP. According to Granier and Kudo (2016), effective engagement of citizens is a key element in the development of SCs. Citizens and their creativity, knowledge are important stakeholders in SC initiation (Kondepudi & Kondepudi, 2015). As stated by Therefore, engaging in decision making and providing positive and negative views on the project were identified as the contributions of citizens in a SCP.

Government

SCs provide solutions in overcoming the challenges generated due to rapid urbanisation (Angelidou, 2014). Government is accountable for knowledge creation and capitalization, which is required for the establishment of the SC concept (Lombardi, Giordano, Farouh, & Yousef, 2012). According to Anttiroiko, Valkama, and Bailey (2014), in SC development projects, Governments are required to provide a range of infrastructure wand welfare services to citizens. Moreover, Governments are required to initiate and involve in policy making and in making the required legal background for initiating SCs (Wiig, 2015). As stated by Granier and Kudo (2016), local Government has become very important in SC development as public services are provided by the Government. Accordingly, knowledge creation and capitalization,

initiating project, providing required infrastructure and welfare services, involve in policy making, making the required legal background and improve the living standard and the quality of life of their citizens were identified as the contributions of the Government in a SCP.

Developers

Property developers are interested in innovation and technological advancements in property development of a SC. Therefore, property developers' contribution for SC development is important. The developers are necessitated to exploit recent opportunities in technology and economy in order to provide a better development of the project (Mosannenzadeh, et al., 2017). Therefore, utilising innovation and technological advancements and exploit economic opportunities were identified as the contribution of the developers in a SCP.

Non-profit organisations

According to the literature, initiation and implementation of SCPs arise numerous results, which the social and non-profit organisations are aware of. Significant learning processes in each stage of SC is important for these stakeholders (van Winden & van den Buuse, 2017). Therefore, commenting on the project activities was identified as the contribution of the non-profit organisations in a SCP.

Urban Planners

The concept of SCs is currently identified as the key goal of the urban planners (Stratigea, Papadopoulou, & Panagiotopoulou, 2015). Therefore, urban planners are crucial in the initiation of SCs. Urban planners review the requirements of the citizens before planning the services in SC development. According to the review, planning sustainability and review the requirements of the citizens before planning were determined as the contributions of the urban planners.

Policy makers

Developing the required policies and implementation is an important process, which guides the path to better transparency and accountability in a SC (Kondepudi & Kondepudi, 2015). In the development of policies, attaining SUD is a key objective. As a result, the policy makers are more concerned in developing policies, which lead a city to be smart (Stratigea, Papadopoulou, & Panagiotopoulou, 2015). As stated by Papa (2013), in present, the policy makers are much focused on SC development. Therefore, planning sustainability is recognised as the main contribution of the policy makers in SC projects.

Political Institutions

With reference to Ferna ndez-Anez, Ve lazquez-Romera and Perez-Prada (2016), sharing the experiences of the political institutions is advantageous for the present and future SCPs. Therefore, engagement of the political institutions in SCPs is a key for the success. Moreover to the authors, political institutions can influence on the governance of a SC. Accordingly, sharing their experiences and commenting on the governance of SCs were identified as the contributions if the political institutions.

Media

According to Angelidou (2014), the influence of media can be positive or negative in reporting to the community. Though, it was identified that Media could carry out an important role in a SCP, as it is the main method of transferring information to the general public regarding the projects and the updates regarding the project activities. Therefore, reporting problems and the advantages of a SCP is identified as the contribution of Media in a SCP.

In accordance with the characteristics of internal stakeholders and external stakeholders illustrated in Section 2.4.2, the stakeholders of SCPs were classified as internal and external stakeholders. Mapping of the stakeholders with the characteristics of internal and external stakeholders is presented in Table 2.4.

Table 2.4: Mapping of the stakeholders with the characteristics of internal and external stakeholders

Characteristics of stakeholders	Academia and Research Institutions	Local and regional administrations	Financial suppliers/Investors	Energy suppliers	ICT sector representatives	Citizens	Government	Developers	Non-profit organisations	Urban Planners	Policy makers	Political Institutions	Media
Internal													
Active involvement in the project		✓	✓	✓	✓		✓	✓		✓	✓		
Interested in the financial activities and efficiency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Formally connected with the project		✓	✓	✓	✓		✓	✓		✓			
Important with regard to the project's economic interests, such as suppliers, sponsors, and customers		✓	✓	✓	✓		✓	✓		✓	✓		
Have overall managerial responsibility and power		✓	✓				✓	✓		✓	✓		
Have a contractual relationship with the project owner		✓	✓	✓	✓		✓	✓		✓			
External													
Outside the main operations of a project	✓					✓			✓			✓	✓
Interested in the value and quality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Not formal members of the project coalition	✓					✓			✓			✓	✓
May affect or be affected by the project	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Influence the project through political lobbying, regulation and campaigning	✓					✓			✓			✓	✓
Directing actions without direct involvement	✓	✓				✓	✓		✓		✓	✓	✓

From the analysis of Table 2.4, financial suppliers/ investors, ICT sector representatives, government, local and regional administrations, energy suppliers, developers and policy makers were determined as internal stakeholders of SCPs. Non-

profit organisations, political institutions, citizens, media and academia and research institutions, can be classified as external stakeholders in SCPs. The findings are demonstrated in Figure 2.12.

Figure 2.12: Stakeholders in a SCP

2.6   Exploration of the Research Gap through the Literature Review

Findings of the literature review depicts the requirement of enabling the engagement of stakeholders in SC projects in order to achieve SUD. Internal and external stakeholders in SC projects and their contributions were reviewed through the literature review. In accordance with the findings regarding the stakeholders in a SC project and regarding their contribution in a SC project, a conceptual model was developed and presented in Figure 2.13. Internal and external stakeholders of SC projects are presented in the two sides using two colours and the contributions are linked with each stakeholder.

2.7   Chapter Summary

Under this chapter, characteristics of SCPs were reviewed through a comprehensive literature review. Definitions of SCs were analysed and a definition for SCs was developed. Human factors, technological factors and institutional factors were identified as the three main dimensions of SCs and under them sub factors were identified. Different developed models of SCs were analysed in order to capture information regarding the characteristics of SCs. The importance of SCs for SUD was also reviewed in this chapter. A definition for SUD was also developed under this chapter.

Furthermore, the concept of stakeholder management and stakeholder engagement was reviewed and the importance of stakeholder engagement in SCPs was identified. Moreover, thirteen (13) stakeholders in a SCPs and their contributions were identified through the literature review. The identified stakeholders were divided as internal and external stakeholders in accordance with the characteristics of internal and external stakeholders. Financial suppliers/ investors, government, local and regional administrations, energy suppliers, developers, ICT sector representatives and policy makers were identified as internal stakeholders of SCPs whereas, non-profit organisations, media, citizens, political institutions and Academia and Research Institutions were determined as external stakeholders of SCPs. The findings were illustrated in a conceptual model.
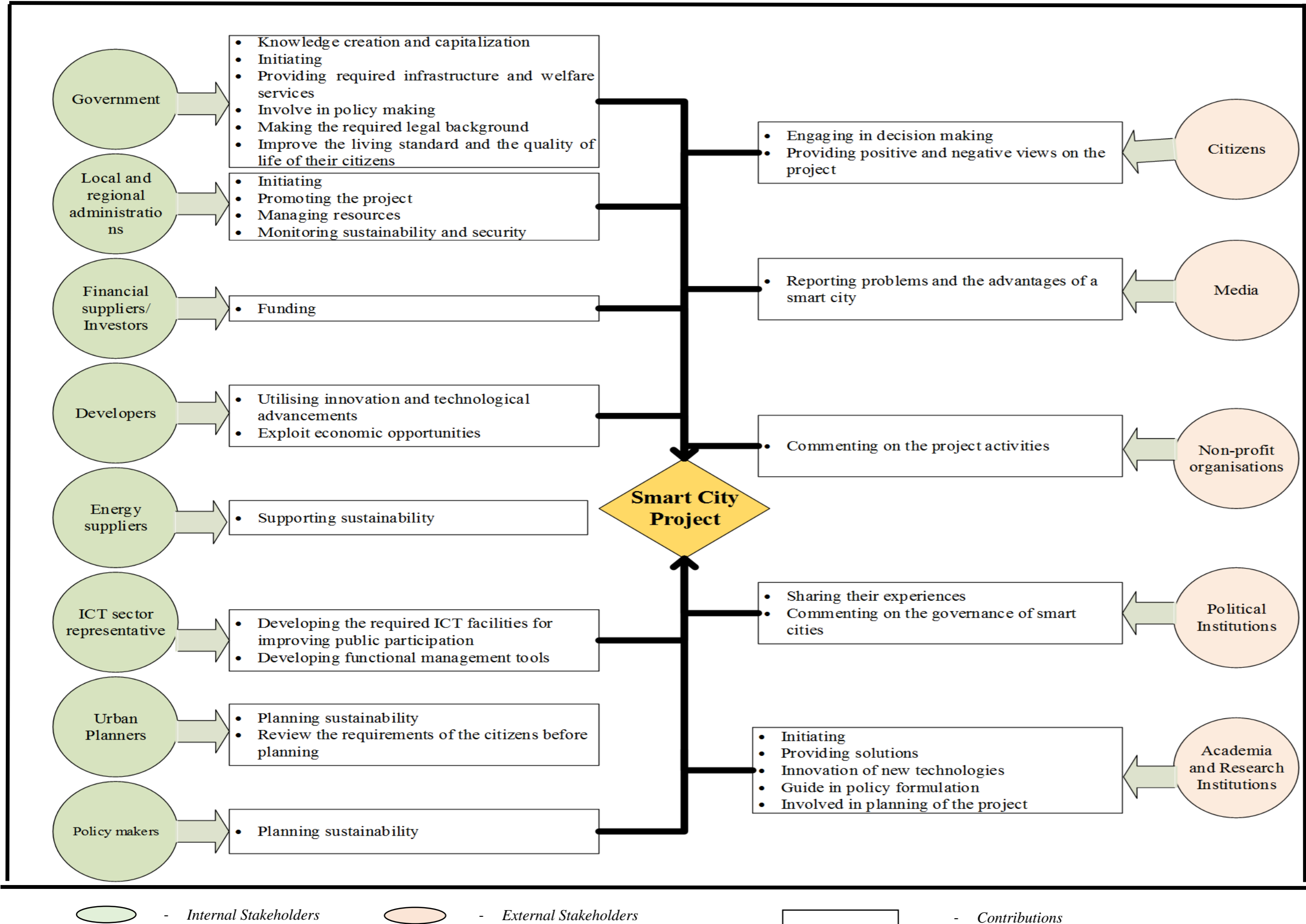
Figure 2.13: Conceptual Model

3.0 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter illustrates the methodology of the research, in which the research is conducted. This chapter provides the systematic way to resolve the research problem. This accounts to a detailed description of the research design, research approach, data collection techniques and data analysis techniques with the justifications for the selection.

3.2 Research Design

Fellows and Liu (2008) stated that research methodology comprises the entire process ranging from theoretical underpinning to data collection and analysis. The main function of a research design is to explain the process to find answers to the research questions (Kumar, 2011). Figure 3.1 illustrates the research design of the study. The aim, objectives and the research question were developed upon the information obtained from the background study, which was conducted at the initial stage of the research. Data collection and analysis were done in two (2) stages. Subsequently, validation of the outcome was carried out and finally, conclusions and recommendations were provided. Figure 3.1 illustrates the research design of the study.

3.3 Research Approach

Quantitative approach, qualitative approach and mixed approach are the widely used fundamental research approaches identified (Creswell, 2013). According to Dawson (2002), each approach consists of their own advantages and disadvantages and there is no any specific best approach.
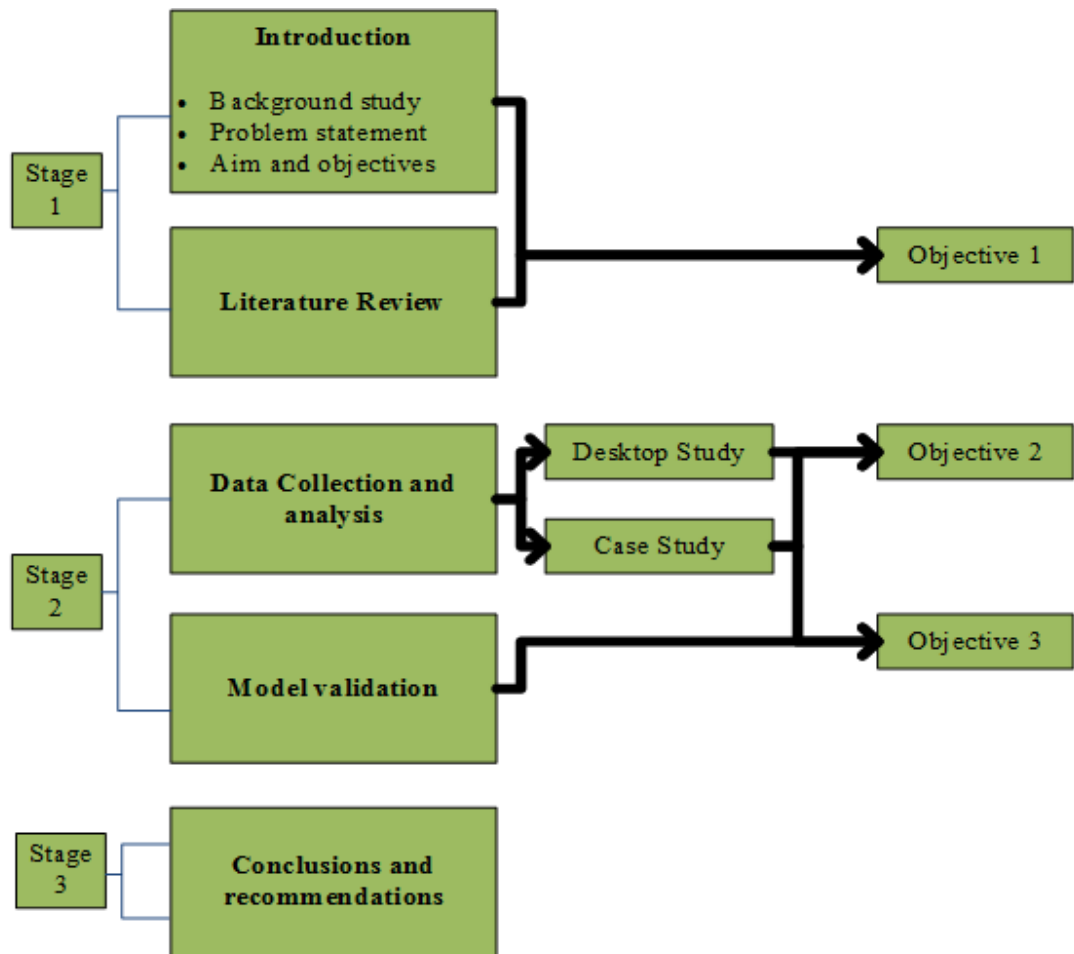
Figure 3.1: Research Design

3.3.1 Quantitative Approach

Nauom (2007) stated that the quantitative approach is an objective, fact-finding process Results related to a sample population can be generated through the use of quantitative research approach (Harwell, 2011). According to Creswell (2014), quantitative approach is utilised to prove the objectives through the development of relationships among the variable with use of statistical analysis.

3.3.2 Qualitative Approach

According to Dawson (2007), qualitative approach is a subjective process aimed at exploring attitudes, demeanour, experience and opinions of the participants. Yin (2011) explained that qualitative approach contributes to explore emerging concepts

through in-depth investigation. Furthermore, a small sample of respondents is adequate when undertaking qualitative approach.

3.3.3 Mixed Approach

As stated by Sandelowski (2000), mixed-method research is stated as an important option for increasing the scope and enhancing the logical power of studies. According to Creswell (2014), undertaking mixed method approach gives a detailed understanding about the research problem. Using mixed method approach improves the validity and reliability of the resulting data and strengthens causal inferences by providing the opportunity to observe data convergence or divergence in a hypothesis testing (Abowitz & Toole, 2009).

3.3.4 Selected Approach for the study

SC concept is a novel concept in Sri Lanka and only one SCP could be identified in Sri Lanka. In order to achieve the aim of the research, which is to enable effective engagement of stakeholders in SCPs in Sri Lanka, an in-depth analysis of the stakeholders and their contributions in SCPs was required to be carried out. Though, for the identification of the key stakeholders in a SCP in Sri Lanka, an in-depth analysis was not required. According to Nauom (2007), for fact finding, where in-depth analysis is not required, quantitative research approach is suitable. Therefore, to determine the key stakeholders of SCPs and their importance, a quantitative analysis was adopted.

For an in-depth study, qualitative approach was identified as the ideological approach. Moreover, when research requires the experience and different perspective of people, the most ideal approach is identified as the qualitative approach (Bricki & Green, 2007). Therefore, for the further and in-depth investigation on the stakeholders and their contributions, qualitative analysis was required to be adopted. Therefore, mixed approach was chosen as the research approach of the study, which provides a detailed understanding of the research problem.

3.4 Research Strategy

As stated by Creswell (2009), the research strategy provides a specific direction for the procedures, which are required to be carried out in a research. Mixed approach strategies are discussed below.

3.4.1 Mixed approach strategies

Under mixed approach strategies, Creswell (2014) stated three strategies as explanatory sequential mixed method, convergent parallel mixed method and exploratory sequential mixed method. Furthermore, Lieberman (2005) stated another mixed approach strategy named as the nested strategy. Moreover to the author, "nested strategy combines the statistical analysis of a larges ample of cases with the in-depth investigation of one or more of the cases contained within the large sample" (p.435). Explanatory sequential mixed method involves quantitative analysis phase first and from the findings gained through the quantitative analysis, in-depth information are provided in a qualitative manner. Exploratory sequential mixed method initially conducts the qualitative analysis and subsequently the quantitative phase is conducted. A combination of quantitative and qualitative data analysis together is stated as convergent parallel mixed method (Creswell, 2014).

3.4.2 Selected research strategy for the study

In this research, explanatory sequential mixed method was utilised in order to achieve the research aim of the study. Data for the quantitative analysis was gained by conducting a desktop study through newspaper analysis and subsequently, a case study was carried out.

a. Desktop study

As stated by Prescott (2008) desktop study is a speedy and easy technique for collecting data from the available sources. It reduces the time for data collection and improves to the precision of conclusion, because the data is composed with reliable and published sources. Further, it forbids interviewee bias and allows researchers to access to valuable information at little or no cost. Since desk review is used prior to

primary research, it helps to simplify the research question and line up the focus of large scale primary research (Prescott, 2008). In this research, the desktop study was carried out through a newspaper review.

b. Case study

Through the case study strategy, a detailed analysis regarding a specific case could be carried out. As stated by Yin (2009), case studies can be conducted as single case study or as multiple case studies. Moreover to the author, single case study is used for unique circumstance and multiple case studies can be conducted with the availability of the cases. In Sri Lanka only one SCP can be identified and thus, single case study approach was selected in this research.

Unit of analysis

In order to determine the unit of analysis it is suggested to focus on the area required to be analysed (Baxter & Jack, 2008). As this research focuses on the engagement of the stakeholders in SCPs, the unit of analysis is 'stakeholder engagement SCPs'. The case boundary is 'SCPs in Sri Lanka'. Figure 3.2 illustrates the research boundary and the unit of analysis.
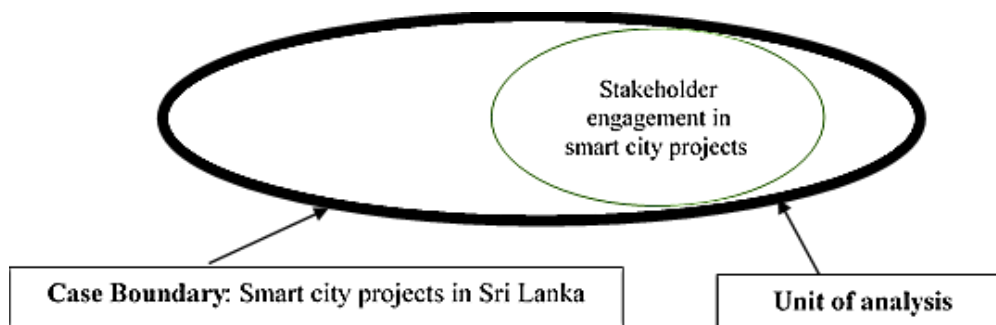
Figure 3.2: Research boundary and unit of analysis

3.5   Research Techniques

Under this section, data collection and analysis techniques of the collected data are discussed.

3.5.1 Data Collection Techniques

a. Desktop Study - Newspaper Review

Desktop study was carried out through the analysis of newspaper articles in five (5) years regarding UDPs in Sri Lanka because of the less sample of article regarding the SCPs in Sri Lanka. Details of the selected newspapers are presented in Table 3.1.

Table 3.1: Selected newspapers

Newspaper code	Language	Frequency
N1	English	Weekly
N2	Sinhala	Weekly

Due to the time constraint, two selected newspapers were reviewed and weekly published newspapers were selected because of the availability of more articles regarding the UDPs in the weekly published newspapers.

b. Case Study - Semi structured interviews

According to Yin (2011), there are several methods, which could be used as data collection techniques in case studies such as interviewing, observing, collecting and examining and feeling. The most common identified data collection techniques include interviews, observation and document review.

Semi structured interviews guide in gaining in depth human opinions and thus, used by most researches. According to Sekaran (2003), the opinions can be clarified and further details regarding the opinions can be obtained through semi structured interviews. Therefore, in this research, nine (9) semi structured interviews were carried out among the project team members to capture data from the case study as the research focus is on enabling the engagement of stakeholders in SCPs. The profile of the interviewees are presented in Table 3.2.

Table 3.2: Profile of the interviewees

Interviewee	Role in the project	Experience (years)
I 1	Project Director	25
I 2	Project Deputy Director	23
I 3	Project Consultant	14
I 4	Project Mechanical, Electrical and Plumbing (MEP) Manager	17
I 5	Architect	12
I 6	Project's Town Planner	9
I 7	Project Consultant	16
I 8	Project Contractor	16
I 9	Project Contractor	11

3.5.2 Data Analysis Techniques

Data analysis techniques utilised in this study are discussed in the subsequent sections.

a. Desktop study - Descriptive statistics

Descriptive statistics were used to analyse the collected data from the desktop study. Accordingly percentages were derived through the number of citations from the total number of articles.

b. Case study – Content analysis

Content analysis technique was utilised in this research in order to analyse the data captured from the case study. Content analysis is defined as a process of coding the qualitative information to categories the data to develop patterns and to repot the information (Kumar, 2011).

3.6 Model Validation

An expert survey among five (5) stakeholders in the case study was carried out in order to validate the developed model. The sample of stakeholders from the case study was selected under the basis of purposive sampling because of the limited number of experts available in the country regarding SCs. Findings were analysed quantitatively with descriptive statistics. The profile of the respondents are presented in Table 3.3.

Table 3.3: Profile of the respondents of the expert survey

Experts	Designation in project	Experience (years)
EI 1	Project Deputy Director	23
EI 2	Project MEP Manager	17
EI 3	Project's Town Planner	13
EI 4	Project Consultant	16
EI 5	Project Contractor	16

3.7   Chapter Summary

The research was conducted in order to ensure the engagement of stakeholders in SCPs. Explanatory sequential strategy under mixed approach was selected as the research approach in this research. A desktop study was selected to be carried out through newspaper analysis of two newspapers for five years and subsequently a single case study was selected as the qualitative strategy. Semi structured interviews were selected as the data collection technique in order to capture data from the case study. A sample of five experts in the case study were chosen for the model validation.

4.0 CHAPTER 4: DATA ANALYSIS AND FINDINGS: DESKTOP STUDY

4.1 Introduction

This chapter presents analysis and findings of the desktop study. The desktop study was carried out through a newspaper review. Newspaper articles regarding the UDPs in Sri Lanka were reviewed in two (2) National newspapers in two (2) languages, Sinhala and English, for five years. Types of stakeholders and their contributions in SCPs were identified through the desktop study.

4.2 Details of the Desktop Study

An inductive approach was used to analyse newspaper articles regarding UDPs in Sri Lanka. As stated by Bengtsson (2016), the researcher analyses the text with an open mind, in inductive approach. Moreover, Kondracki et al. (2002) have stated that, it is more advantageous to follow an inductive approach initially. Therefore, inductive approach was used for the analysis of the newspaper articles. Stakeholders of UDPs in Sri Lanka and their influence/ contribution for the UDPs were identified through reviewing newspaper articles for five (5) years.

The reviewed newspaper articles regarding the UDPs in Sri Lanka during the five years period, from November, 2013 to October, 2018, were analysed by comparing the number of articles in a year. Newspaper articles regarding UDPs in Sri Lanka in each newspaper in each month of the year are presented in Table 4.1. Moreover, the total number of articles in the 2 newspapers in each month of the 5 years and the total number of articles in each year are also presented. Totally, 145 newspaper articles were reviewed for the collection of data in this research.

Table 4.1: Analysis of the newspapers

Month / Year	January N1	N2	February N1	N2	March N1	N2	April N1	N2	May N1	N2	June N1	N2	July N1	N2	August N1	N2	September N1	N2	October N1	N2	November N1	N2	December N1	N2	Total number of articles
Year 1 (2018 Oct - 2017 Nov)	4	2	0	3	1	0	2	1	1	1	1	2	4	2	3	1	3	2	3	1	1	2	0	1	41
Year 2 (2017 Oct - 2016 Nov)	1	1	1	1	1	0	2	1	2	1	2	1	2	2	3	2	1	0	2	2	0	1	2	2	33
Year 3 (2016 Oct - 2015 Nov)	2	1	1	1	1	1	2	2	1	0	3	0	3	3	2	3	0	0	3	1	1	2	1	2	36
Year 4 (2015 Oct - 2014 Nov)	0	0	3	0	2	2	2	0	0	1	2	1	0	0	1	0	0	2	1	0	0	1	1	0	19
Year 5 (2014 Oct - 2013 Nov)	1	0	2	0	2	1	0	1	1	1	1	0	1	0	0	0	1	1	1	0	1	0	1	0	16
Total number of articles	12		12		11		13		9		13		17		15		10		14		9		10		145

N1 – Newspaper 1

N2 – Newspaper 2

From the findings presented in Table 4.1, it can be determined that a higher number of newspaper articles are published in the months of July (17), August (15) and October (14) whereas, the minimum number of articles regarding UDPs in Sri Lanka were published in the months of May (9) and November (9). The number of newspaper articles are given in the parenthesis. Moreover, as depicted in Table 4.1, the total number of newspaper articles reviewed has gradually increased in the five years from 16 to 41. This illustrates the concern of the UDPs in Sri Lanka has been increased within the last five years.

The types of stakeholders in SCPs are presented in Section 4.3 and the contributions of the stakeholders in SCPs are discussed in Section 4.4

4.3   Types of stakeholders in SCPs

Stakeholders in UDPs were identified initially through the desktop study and further, the identified stakeholders were compared with the stakeholders identified from the literature review. The identified stakeholders through the desktop study are presented in Section 4.3.1 and Section 4.3.2 illustrates the comparison of the findings of the literature review and the desktop study. Accordingly, stakeholders in a SCP were determined.

4.3.1   Stakeholders in UDPs in Sri Lanka

In accordance with the findings of the newspaper review for the last five (5) years, stakeholders of UDPs in Sri Lanka were ranked by considering the percentage of number of citations in the hundred and forty five (145) newspaper articles. The rankings of the stakeholders with the cited percentage are presented in Table 4.2.

Table 4.2: Stakeholders of UDPs

Stakeholders	Number of citations from 145	Citations as a percentage	Rank
Government	71	48.97	1
Foreign investors	42	28.97	2
Foreign contractor organisations	31	21.38	3
Ministry of Megapolis and Western Development	17	11.72	4
Citizens	14	9.66	5
Private sector financial institutions	14	9.66	5
UD Authority (UDA)	13	8.97	6
Ports Authority	12	8.28	7
Coast Conservation Department (CCD)	9	6.21	8
Road Development Authority (RDA)		6.21	8
Foreign consultant organisations	9	6.21	8
Academia and Research Institutions	8	5.52	9
Central Environmental Authority (CEA)	7	4.83	10
Local Contractors	6	4.14	11
Electricity Board (CEB)	5	3.45	12
Media	5	3.45	13
Ministry of Highways, Ports and Shipping	4	2.76	14
National Water Supply and Drainage Board	3	2.07	15
National Aquatic Resources Research and Development Agency (NARA)	3	2.07	16
Public Utilities Commission	3	2.07	17
Energy authorities	2	1.38	18
Municipal Councils	2	1.38	18
Board of Investment	2	1.38	18
Opposition political parties	2	1.38	18
Ministry of Environment	1	0.69	19
Irrigation department	1	0.69	19
Chamber of Construction Industry	1	0.69	19
Non-Governmental Organisations (NGO)	1	0.69	19

As depicted in Table 4.2, twenty seven (27) stakeholders were identified as stakeholders through the newspaper review. One article published in July, 2016 states *"disagreements among the key stakeholders and internal squabbles are blocking the progress of the much-awaited Megapolis project"*. This bears evidence on the importance of the stakeholders in the development projects. According to the findings presented in Table 4.1, Government is identified as the stakeholder with the highest

citation percentage, which is 48.97%. The secondly ranked stakeholder is identified as foreign investors (28.97%). A substantial difference can be identified between the firstly ranked stakeholder in comparison with the secondly ranked stakeholder. Therefore, Government can be determined as the most significant stakeholder. In accordance to the citation percentages, foreign contractor organisations become the thirdly ranked stakeholder. Moreover, foreign consultant organisations' (6.21%) was ranked as the eighth position. Therefore, it can be clarified that, foreign countries play a major role in the Sri Lankan UDPs. The citation percentages are presented in the parenthesis.

Ministry of Megapolis and Western Development (11.72%) is ranked as the fourth among the stakeholders in an UDP. Citizens (9.66%) are also identified as a stakeholder, which is ranked at fifth. Equal positions were achieved by citizens and private sector financial institutions because of their important contributions in the UDPs in Sri Lanka. A substantial difference between the percentage of citations of UD authority and ports authority cannot be identified. This states the equal importance of the two stakeholders. Through the analysis of the derived results, it can be determined that Coast Conservation Department (CCD) and Road Development Authority (RDA) (6.21%) are also identified as equal contributors.

The least number of citations were achieved by the Ministry of Environment, Irrigation Department, Chamber of Construction Industry and Non-Governmental Organisations (NGO). Though the above mentioned stakeholders have a considerably less percentage of citations, in the UDPs, their contribution can be identified as important. An article published in August, 2016 state "*some NGOs and activists against the Colombo Port City project have decided to agitate on their own without any political affiliation*". This states that NGOs are considerably affecting on the development projects in Sri Lanka. According to Rizwie (2016), "*even before construction work can begin, there were serious allegations in the Media of a contract being awarded to the Metallurgical Construction Company (MCC) of China for the first section, from Kadawatha to Mirigama, without a tender and at a higher cost than previously slated*". This states the importance Media as a stakeholder in UDPs as well.

4.3.2 Comparison of the findings of the literature review with the findings of the desktop review

Through the analysis of the desktop review, Government is identified as the main stakeholder in the UDPs. Alawadhi, et al. (2012) have also stated Government as the most significant stakeholder in SCPs because, the initiation of the Government is an essential requirement. Moreover, Paskaleva (2011) also highlighted the significance of Government in the SCPs and identified Government as a major contributor.

In the findings of the desktop study, foreign investors and foreign contractor organisations are ranked at the second and third positions consequently. In the literature findings under Section 2.5.2, financial suppliers and investors were identified as a stakeholder in SCPs. Other than the foreign investors and foreign contractor organisations, local private sector financial institutions and foreign consultant organisations were identified through the desktop review as financial suppliers and investors, who are important in the development projects. Investors were identified as a key stakeholder in SCPs because investments are vital as an initiative for the project (Thite, 2011). This proves the findings of the desktop review.

As per the findings in Section 2.5.2, Local and regional administrations were identified as another important stakeholder in SCPs. The findings of the desktop review are proved by this statement because, ten (10) Local and Regional Administrative Bodies in Sri Lanka were identified. Coast Conservation Department (CCD), Ports Authority, National Aquatic Resources Research and Development Agency (NARA), UD Authority (UDA), Central Environmental Authority (CEA), Energy Authorities, Municipal Councils, Board of Investment, Public Utilities Commission and Road Development Authority (RDA) were identified as stakeholders in the through the newspaper review.

It is important to note that citizens are identified as an important stakeholder through the desktop study. According to Granier and Kudo (2016) and Stratigea, Papadopoulou and Panagiotopoulou (2015), citizens were identified as an important category for SC development as their participation in the project is critical to minimise the problems

generated in a city. Therefore, for SCPs, citizens can be identified as a significant stakeholder.

Developers were identified as another stakeholders in the development projects, through the newspaper article analysis. According to the findings, developers include, local contractors, chamber of construction industry and the irrigation department. According to Angelidou (2014) and Larios, Gomez, Mora, Maciel, and Villanueva-Rosales (2016) also, developers play a major role in SC development projects. Therefore, it is established that developers are also an important category of stakeholders for SC development projects.

Findings of Section 2.5.2 illustrates that energy suppliers, representatives of the ICT sector are significant in the development of SCs through the utility supply. Moreover, energy suppliers (Electricity Board) and water suppliers (National Water Supply and Drainage Board) were identified as important contributors in the utility supply through the desktop study as well. As a consequence, utility suppliers can be determined as a stakeholder of SC development projects. Verdicts of the desktop study states the importance of Media in the UDPs. Media is also identified as a stakeholder in SC development projects by six authors out of fourteen authors stated in Section 2.5.2. Moreover, NGOs were identified as contributors for SCPs as the finding of the desktop review is proved by the literature findings. Academia and Research Institutions and opposition political parties can also be identified as stakeholders of SC development projects as both findings of the desktop study and the literature review states them as important stakeholders. Table 4.3 illustrates the summary of the stakeholders identified from the literature review and the stakeholders identified from the desktop study. Furthermore, Table 4.3 presents the list of stakeholders identified.

Table 4.3: Stakeholders in a SCP

Stakeholders identified from the literature review	Stakeholders identified from the desktop study	Stakeholders of a SC development project
Academia and Research Institutions	Academia and Research Institutions	Academia and Research Institutions
Local and regional administrations	Local and Regional Administrative Bodies • Ports Authority • UDA • CEA • Energy authorities • Municipal Councils • NARA • CCD • Board of Investment • Public Utilities Commission • Road Development Authority	Local and Regional Administrative Bodies
Financial suppliers and Investors	Financial suppliers and Investors • Private sector financial institutions • Foreign investors • Foreign contractor organisations • Foreign consultant organisations	Financial suppliers and Investors
Energy suppliers	Energy suppliers (Electricity Board)	Utility and service providers
Water suppliers	National water supply and drainage board	
ICT sector representatives	-	
Citizens	Citizens	Citizens
Government	Government • Ministry of Megapolis and Western Development • Ministry of Environment • Ministry of Highways, Ports and Shipping	Government
Developers	Developers • Local Contractors • Chamber of Construction Industry • Irrigation department	Developers
Non-profit organisations	Non-profit organisations (NGO)	Non-profit organisations
Media	Media	Media
Urban Planners	Includes in local and regional administrations	-
Policy makers	Includes in local and regional administrations	-
Political Institutions	Opposition political parties	Opposition political parties

Mapping of the stakeholders with the characteristics of internal and external stakeholders is illustrated in Table 4.4. According to the mapping, Government, Local and Regional Administrative Bodies, financial suppliers/ investors utility suppliers and developers are categorised as the internal stakeholders in SCPs whereas, Academia and Research Institutions, Media, citizens, non-profit organisations and opposition political parties are categorised as the external stakeholders in SCPs.

4.4 Contributions of stakeholders in SCPs

The findings of the desktop study are compared with the findings of the literature review and accordingly, the contributions of the stakeholders in SCPs were determined. The analysis of the contributions of each stakeholder identified in the desktop review is attached in Annexure A. In the subsequent sections, contributions of these stakeholders are also discussed under the contributions of the main category of stakeholders in SCPs.

Table 4.4: Mapping of the stakeholders with the characteristics of internal and external stakeholders

Stakeholders / Characteristics of stakeholders	Government	Local and Regional Administrative	Media	Financial suppliers/ investors	Academia and Research Institutions	Citizens	Utility suppliers	Developers	Non-profit organisations	Opposition political parties
Internal										
Active involvement in the project	✓	✓		✓			✓	✓		
Interested in the financial activities and efficiency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Formally connected with the project	✓	✓		✓			✓	✓		

Important with regard to the project's economic interests, such as suppliers, sponsors, and customers	✓	✓		✓			✓	✓		
Have overall managerial responsibility and power	✓	✓		✓			✓	✓		
Have a contractual relationship with the project owner	✓	✓		✓			✓	✓		
External										
Outside the main operations of a project			✓		✓	✓			✓	✓
Interested in the value and quality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Not formal members of the project coalition			✓		✓	✓			✓	✓
May affect or be affected by the project	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Influence the project through political lobbying, regulation and campaigning			✓		✓	✓			✓	
Directing actions without direct involvement			✓		✓	✓			✓	✓

4.4.1 Contributions of the Government in SCPs

Through the findings in Section 4.3.1, Government can be determined as an important stakeholder in SCPs. Table 4.5 illustrates the ranking of the contributions by the Government in accordance with the number of newspaper articles. Accordingly, 19 contributions were identified.

Table 4.5: Contributions of the Government

Contributions	Number of citations from 145	Citations as a percentage	Rank
Initiating project and implementation	41	28.28%	1
Finalising the legal framework	8	5.51%	2
Planning	6	4.14%	3
Funding	4	2.76%	4
Implementing PPP	4	2.76%	4
Decision making	3	2.07%	5
Monitoring sustainability	3	2.07%	5
Trying to attract investors	2	1.38%	6
Inspection	2	1.38%	6
Pay compensation	2	1.38%	6
Discussing with the investors	2	1.38%	6

Obtaining environmental improvements	1	0.69%	7
Getting the registrations	1	0.69%	7
Promoting the project	1	0.69%	7
Expedite the process	1	0.69%	7
Negotiating with the contractors	1	0.69%	7
Providing advices	1	0.69%	7
Approving/ Rejecting approval	1	0.69%	7
Identifying the requirement of the project	1	0.69%	7

In the analysis of the contributions of the Government, 28.28% of the newspaper articles state that 'initiation and the implementation of the project' had been carried out by the Government. Moreover, Jimenez, Solanas and Falcone (2014) also stated that the SCPs are required to be initiated by the Government, as they are responsible in improving the quality of life of the citizens. Therefore, it can be determined that, initiation of the project and implementation is the most important contribution of the Government in the SCPs. The secondly ranked contribution of the Government is 'finalising the legal framework', which the percentage of citations is 5.51%. 'Creating the required legal background' and 'involving in policy making' are identified as important contributions by the Government by Schuurman, Baccarne, De Marez and Mechant (2012) as well. Though, in the findings in the desktop review, 'involving in policy making' was not identified as a contribution of the Government, which shall be included as a contribution of the Government in SCPs.

'Planning', 'funding', 'implementing PPP' and 'decision making' were consequently ranked as third fourth and fifth contributions. This states that the Government facilitates the background required for the execution of the project. Though Government has also funded for the projects, in comparing with foreign investors, Government was not identified as significant contributor for funding in Sri Lanka. According to Angelidou (2015) also, 'providing required infrastructure and welfare services' in the development of SCs and 'improving the living standard of the citizens' are important contributions of the Government.

Through the analysis it was identified that 'negotiating with the contractors' and 'expediting the processes' of the UD project has only been carried out by the Government. Furthermore, 'implementing PPP', getting the required registrations' and

'inspection' has also been executed only by the Government in the UDPs. Moreover, it can be determined that Government takes the leadership in obtaining environmental improvements, getting the registrations, promoting the project and expedite the process of the projects. A small scale contribution of the Government can be identified in approving/ rejecting proposals and in providing advices for the UDPs. Moreover, Lombardi, Giordano, Farouh, and Yousef (2012) identified the importance of knowledge creation and capitalisation required for SCP. Though, this contribution was not identified as a finding of the desktop review.

4.4.2 Contributions of Local and Regional Administrative Bodies

The contributions of the Local and Regional Administrative Bodies are identified as important for the UDPs in Sri Lanka. Table 4.6 represents the contributions of the Local and Regional Administrative Bodies. Ports Authority, UDA, CEA, Energy Authorities, municipal councils, NARA, CCD, Board of Investment, Public Utilities Commission and RDA are the stakeholders identified from the desktop review under, Local and Regional Administrative Bodies.

Table 4.6: Contributions of Local and Regional Administrative Bodies

Contributions	Number of citations from 145	Citations as a percentage	Rank
Initiating project and implementation	11	7.59	1
Approving/ Rejecting approval	9	6.21	2
Monitoring sustainability	7	4.83	3
Handling the project	6	4.14	4
Communicating with Media	6	4.14	4
Administrative actions	6	4.14	4
Planning	5	3.45	5
Coming up with proposals	5	3.45	5
Conducting EIA	4	2.76	6
Coordinating	3	2.07	7
Solving challenges	3	2.07	7
Commenting on the project activities	3	2.07	7
Providing advices	2	1.38	8
Provide reasoning for the project	1	0.69	9
Promoting the project	1	0.69	9
Representing the Sri Lankan Government	1	0.69	9
Discussing with the investors	1	0.69	9

Acquisition of lands required for the project	1	0.69	9
Identifying the requirement of the project	1	0.69	9
Funding	1	0.69	9

Similar to the contributions of the Government, initiating project and implementation is identified as the most significant contribution (7.59%) of the Local and Regional Administrative Bodies. According to van Winden and van den Buuse (2017), Local and Regional Administrative Bodies are responsible in initiating the SCPs. Therefore, the finding of the desktop review is validated through the literature. Ports authority (2.07%), UDA (1.38%), municipal councils (0.69%), and RDA (1.38%) have contributed for initiation and implementation of UDPs in Sri Lanka. Citation percentage of each stakeholder identified in the desktop study, which are illustrated in the Annexure 'A' are presented in the parenthesis. Initiation and implementation of the project can be identified as the main contribution of the ports authority and RDA. The secondly ranked contribution of the local and regional administrations is identified as 'approving/ rejecting the approvals'. CEA and CCD are identified as the main contributors in approving /rejecting the approvals related to the project.

Rank three contribution of the Local and Regional Administrative Bodies is 'monitoring sustainability'. Monitoring sustainability is identified as the main contribution of CEA, and public utilities commission. CCD (2.76%) can also be identified as a main contributor for monitoring sustainability in the UDPs as a local and regional administrative body. Al-Hader, Rodzi, Sharif and Ahmad (2009) and Gabrys (2014) have identified that monitoring sustainability of the SC development as an important contribution of Local and Regional Administrative Bodies. Therefore, the finding can be validated through literature.

'Handling the projects' is the rank four contributions of the Local and Regional Administrative Bodies. Ports authority (2.07%) and UDA (2.07%) are identified as the main stakeholders under Local and Regional Administrative Bodies in handling the UDPs in Sri Lanka. Moreover, communicating with Media (4.14%) and administrative actions (4.14%) are also identified as other contributions of Local and Regional Administrative Bodies. Ports authority (2.07%) can be identified as the main

communicator with the Media under local and regional administrative bodies, regarding the urban project developments. UDA and Board of investment are identified as the main contributors in conducting the administrative actions of the projects.

'Planning' and 'coming up with proposals' are identified as the rank 5 contributions of Local and Regional Administrative Bodies. Under Local and Regional Administrative Bodies, planning of the UDPs are executed by the ports authority. Planning is the main contribution of the ports authority among the other contributions by the ports authority in the UDPs in Sri Lanka. Ports authority and NARA are identified as the main contributors in 'coming up with proposals' regarding the projects.

'Conducting Environmental Impact Assessment (EIA)' is the rank 6 contribution of the Local and Regional Administrative Bodies, where the main contributor is the CEA (2.07%). Moreover to the findings of the newspaper analysis in the last 5years, Ports authority and the National Aquatic Resources Research and Development Agency (NARA) also can be identified as contributors for conducting EIA.

As depicted in Table 4.6, 'coordinating', 'solving challenges' and 'commenting on the project activities' are the rank 7 contributions of the local and regional administrative bodies. In the execution of the UDPs in Sri Lanka, Ministry of Megapolis and Western Development (1.38%), CCD (0.69%) and academic and research institutions (1.38%) have contributed in solving the challenges raised. Coordination in the projects has been executed by the UDA, public utilities commission and by the RDA. Furthermore, 'commenting on the projects' activities were carried out by NARA, CCD and by chamber of construction industry in Sri Lanka. Among them the main contributor is identified as CCD.

Moreover to the findings of the desktop study, rank nine contributions of the Local and Regional Administrative Bodies are 'providing reasoning for the project', 'promoting the project', 'representing the Sri Lankan Government', 'discussing with the investors', 'identifying the requirement of the project' and 'funding'. In providing reasoning for the project, ports authority is identified as the main contributor. Under

Local and Regional Administrative Bodies, promoting the UDPs has been carried out by the UDA. Furthermore, in some occasions, UDA has represented Sri Lankan Government regarding the UDPs. Municipal council's main contribution is identifying the requirement of the project. Moreover to van Winden and van den Buuse (2017), 'promoting the project' and 'managing the resources' are contribution, which required to be carried out by Local and Regional Administrative Bodies.

4.4.3 Contributions of Media

Findings of the desktop analysis and the literature review identified Media as one of the stakeholders in the UDPs. Table 4.7 presents the rankings of the contributions of Media.

Table 4.7: Contributions of Media

Contributions	Number of citations from 145	Citations as a percentage	Rank
Questioning on the development of the project	3	2.07%	1
Comment on the cost of the project	1	0.69%	2

In accordance with the newspaper review, Media is also identified as a stakeholder in the UDPs in Sri Lanka because they have always questioned regarding the development of the projecst (2.07%) and made comments on the cost of the projects (0.69%). In questioning on the development of the project, Media is identified as the main contributor. Moreover, Stratigea, Papadopoulou and Panagiotopoulou (2015) and Angelidou (2014) identified that reporting advantages and disadvantages of the project to the society as a significant contribution by the Media. Therefore, 'reporting problems and advantages of the project' and 'questioning on the development of the project' can be identified as the contributions of Media in SCPs.

4.4.4 Contributions of financial suppliers/ Investors

Financial suppliers/ investors for an UD project are determined as an important category of stakeholders through the desktop review and their contributions are presented in Table 4.8. As per the findings of the desktop study, private sector financial

institutions, foreign investors, foreign contractor organisations and foreign consultant organisations are identified as the financial suppliers/ investors in UDPs and 10 contributions were identified through the newspaper analysis.

Table 4.8: Contributions of financial suppliers/ Investors

Contributions	Number of citations from 145	Citations as a percentage	Rank
Funding	54	37.24	1
Construction	20	13.79	2
Providing consultancy services	9	6.21	3
Initiating project and implementation	3	2.07	4
Providing advices	3	2.07	4
Carrying out feasibility study	3	2.07	4
Promoting the project	2	1.38	5
Providing loans	1	0.69	6
Supplying labour	1	0.69	6
Planning	1	0.69	6

In accordance with the findings presented in Table 4.8, 'funding' is the most significant contribution of the financial suppliers/ investors in the UDPs. According to the findings of the desktop review, it can be determined that, funding for the UDPs in Sri Lanka has been significantly carried out by the foreign investors (28.97%) and it the main contribution of the foreign investors as well. According to Ferna ndez-Anez, Ve lazquez-Romera and Perez-Prada (2016) also, the main contribution of the investors is funding for the SCPs. Local private sector financial institutions have also funded for the UDPs in Sri Lanka. Furthermore, it can be identified that private sector financial institutions have rendered loans, which are required for the UDPs.

'Construction' is the next contribution of the financial suppliers/ investors in the UDPs and foreign contractor organisations are the main contributors in the construction. Rank three contribution of the financial suppliers/ investors is determined as 'providing consultancy services'. Foreign consultant organisations are identified as the main contributor in providing the consultancy services required for the project.

'Initiating project and implementation', 'providing advices' and 'carrying out feasibility studies' are identified as the rank four contributions of the financial suppliers and investors. Foreign investors and foreign contractor organisations are

determined as important in promoting the project other than the Local Government. Furthermore, foreign contractor organisations have also contributed in 'supplying labour required for the project', which is another contribution of the financial suppliers/ investors.

4.4.5 Contributions of Academia and Research Institutions

Academia and Research Institutions are also identified as a stakeholder in the UDPs, through the newspaper analysis and the literature review. Table 4.9 presents the contributions of the Academia and Research Institutions, which were identified through the desktop study.

Table 4.9: Rankings of the contributions of Academia and Research Institutions

Influences/ contributions	Number of citations from 145	Citations as a percentage	Rank
Providing advices	5	3.45	1
Solving challenges	2	1.38	2

Academic and research institutions are identified as the main contributor in 'providing advices' for the UDPs in Sri Lanka. 'Solving challenges' is the next contribution of the academia and research institutions. Initiating project and providing solutions for the issues arise in the project are identified as contributions of academia and research institutions in SCPs by Larios, Gomez, Mora, Maciel and Villanueva-Rosales (2016). Furthermore, Ielite, Olevsky and Safiulins (2015) also identified that Academia and Research Institutions shall initiate the development of SCs. Furthermore, through the literature survey in Section 2.5.2 it can be identified that academia and research institution are important in guiding in policy formulation, involving in planning and innovating new technologies.

4.4.6 Contributions of citizens

Citizens are another major category of stakeholders in UDPs, which were identified through the desktop review and as well as through the literature review under Chapter 2. Contributions of the citizens are presented in Table 4.10 and subsequently the findings are compared with the literature findings.

Table 4.10: Rankings of the contributions of citizens

Influences/ contributions	Number of citations from 145	Citations as a percentage	Rank
Contributing by giving lands	6	4.14%	1
Protesting against the project	4	2.76%	2

For the UDPs, citizens are identified as the main contributor in giving lands required for the projects. Moreover, citizens have influenced the project by 'commenting on the project activities' through protesting. In addition, literature depicted that the engagement of citizens in decision making in SCPs is identified as significantly important for the success of the project (Capdevila & Zarlenga, 2015; Paskaleva, 2009). Therefore, 'engaging in decision making', 'providing positive and negative views on the projects' and 'providing the required physical assets' can be identified as the contributions of the citizens in SCPs.

4.4.7   Contributions of Utility suppliers

Utility suppliers are another category of stakeholders identified through the comparison of the findings of the desktop study and the literature review. Energy suppliers, water suppliers and ICT sector representatives are identified as the utility suppliers in the UDPs in Sri Lanka. Table 4.11 illustrates the contributions of the utility suppliers in the UDPs in Sri Lanka.

Table 4.11: Contributions of utility suppliers

Contributions	Number of citations from 145	Citations as a percentage	Rank
Funding	1	0.69	1
Promoting the project	1	0.69	1
Handling the project	1	0.69	1
Providing consultancy services	1	0.69	1

Funding, promoting the project, handling the project and providing consultancy services are identified as the contributions of energy suppliers, which have equal importance in the UDPs in Sri Lanka. According to van Winden and van den Buuse (2017), providing sustainable energy in SCPs was identified as a contribution of the

energy suppliers. However, no articles were found in the newspaper analysis in order to identify this contribution of the energy suppliers in UDPs.

4.4.8 Contributions of Developers

Three developers, who are namely, local contractors, irrigation department and Chamber of Construction Industry were identified from the desktop review and the contributions of the developers are stated in Table 4.12.

Table 4.12: Rankings of the contributions of developers

Influences/ contributions	Number of citations from 145	Citations as a percentage	Rank
Contributing with knowledge and services	9	6.21	1
Construction	3	2.07	2
Initiating project and implementation	1	0.69	3
Commenting on the project activities	1	0.69	3

Local contractor organisations have acted as the main stakeholder in contributing knowledge and services required for the UDPs (4.14%). It is identified as the main contribution of the local contractor organisations. Irrigation department have also contributed in the UDPs regarding knowledge and services required. In Section 2.5.2, utilising innovation and technological advancements and exploit economic opportunities were identified as contributions of developers towards SC development projects. Contribution of the local contractor organisations for the construction (2.06%) is comparatively low in comparison with foreign contractor organisations. Initiating project and implementation and commenting on the project activities are identified as the other contributions of the developers as illustrated in Table 4.12.

4.4.9 Contributions of Non-profit organisations

Non-profit organisations are also identified as an interested party in the UDPs in Sri Lanka. Table 4.13 presents the contributions of non-profit organisations.

Table 4.13: Contributions of non-profit organisations

Contributions	Number of citations from 145	Citations as a percentage	Rank
Protesting against the project	1	0.69	1

'Protesting against the project' is the only contribution of the non-profit organisations, which is identified through the newspaper analysis regarding the UDPs in Sri Lanka. As depicted in Section 2.5.2, Fernandez-Anez, Fernández-Güell and Giffinger (2018) also stated that non-profit organisations comment on the projects activities in SCPs. Therefore, 'commenting on the project activities' can be identified as a contribution of non-profit organisations in SCPs.

4.4.10 Contributions of Opposition political parties

Opposition political parties are also a stakeholder category in UDPs in Sri Lanka. The contributions of opposition political parties are illustrated in Table 4.14.

Table 4.14: Contributions of opposition political parties

Contributions	Number of citations from 145	Citations as a percentage	Rank
Protesting against the project	2	1.38	1

Similar to the non-profit organisations, the only contribution of the opposition political parties in UDPs is identified as protesting against the project. In addition 'sharing their experiences' and 'commenting on the governance' are the identified contributions through the literature survey in Section 2.5.2. Accordingly, 'sharing experiences', 'commenting on the governance' and 'commenting on the project activities' can be identified as contribution of the opposition political parties in SCPs.

Through the comparison of the findings of the literature review and the desktop study, contributions of the stakeholders in SCPs are identified and they are presented in Table 4.15. The network of stakeholders and their contributions in SCPs are illustrated in Figure

Table 4.15: Contributions of the stakeholders in SCPs

Stakeholders in SCPs	Contributions identified through the literature review	Contributions identified through the desktop study	Contributions in SCPs
Government	• Knowledge creation and capitalisation • Initiation project • Providing required infrastructure and welfare services • Involve in policy making • Making the required legal background • Improve the living standard and the quality of life citizens	• Initiating project and implementation • Finalising the legal framework • Planning • Funding • Implementing PPP • Decision making • Monitoring sustainability • Trying to attract investors • Inspection • Pay compensation • Discussing with the investors • Obtaining environmental improvements • Getting the registrations • Promoting the project • Expedite the process • Negotiating with the contractors • Providing advices • Approving/ Rejecting approval • Identifying the requirement of the project	• Initiating project and implementation • Providing required infrastructure and welfare services • Knowledge creation and capitalisation • Creating the required legal background • Improve the living standard and the quality of life citizens • Involve in policy formulation • Approving/ Rejecting approval
Academia and Research Institutions	• Initiating the project • Providing solutions • Innovation of new technologies • Guide in policy formulation • Involved in planning of the project	• Providing advices • Solving challenges	• Initiating the project • Providing advices • Solving challenges • Guide in policy formulation • Involved in planning of the project • Innovation of new technologies

Stakeholders in SCPs	Contributions identified through the literature review	Contributions identified through the desktop study	Contributions in SCPs
Local and Regional Administrative Bodies	• Initiating • Promoting the project • Managing resources • Monitoring sustainability and security	• Initiating project and implementation • Approving/ Rejecting approval • Monitoring sustainability • Handling the project • Communicating with Media • Administrative actions • Planning • Coming up with proposals • Conducting EIA • Coordinating • Solving challenges • Commenting on the project activities • Providing advices • Provide reasoning for the project • Promoting the project • Representing the Sri Lankan Government • Discussing with the investors • Acquisition of lands required for the project • Identifying the requirement of the project • Funding	• Initiating project and implementation • Identifying the requirement of the project • Promoting the project • Managing resources • Monitoring sustainability and security • Approving/ Rejecting approval • Representing the Government • Funding
Media	• Reporting problems and the advantages of the project	• Questioning on the development of the project • Make a hue and cry on the cost of the project	• Reporting problems and the advantages of the project • Questioning on the development of the project

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Stakeholders in SCPs	Contributions identified through the literature review	Contributions identified through the desktop study	Contributions in SCPs
Financial suppliers/ investors	• Funding	• Funding • Construction • Providing consultancy services • Initiating project and implementation • Providing advices • Carrying out feasibility study • Promoting the project • Providing loans • Supplying labour & planning	• Funding • Construction • Providing consultancy services • Initiating project and implementation • Carrying out feasibility study • Promoting the project • Providing loans • Supplying labour • Planning
Citizens	• Engaging in decision making • Providing positive and negative views on the project	• Contributing by giving lands • Protesting against the project	• Engaging in decision making • Providing positive and negative views on the project • Providing the required physical assets
Utility suppliers	• Providing sustainable energy supply	• Funding • Promoting the project • Handling the project • Providing consultancy services	• Providing Sustainable energy supply • Funding • Promoting the project • Handling the project • Providing consultancy services
Developers	• Utilising innovation and technological advancements • Exploit economic opportunities	• Contributing with knowledge and services • Construction • Initiating project and implementation • Commenting on the project activities	• Contributing with knowledge and services • Utilising innovation and technological advancements • Exploit economic opportunities • Initiating project and implementation • Commenting on the project activities
Non-profit organisations	• Commenting on the activities	• Protesting against the project	• Commenting on the project activities
Opposition political parties	• Sharing their experiences • Commenting on the governance	• Protesting against the project	• Sharing their experiences • Commenting on the governance • Commenting on the project activities
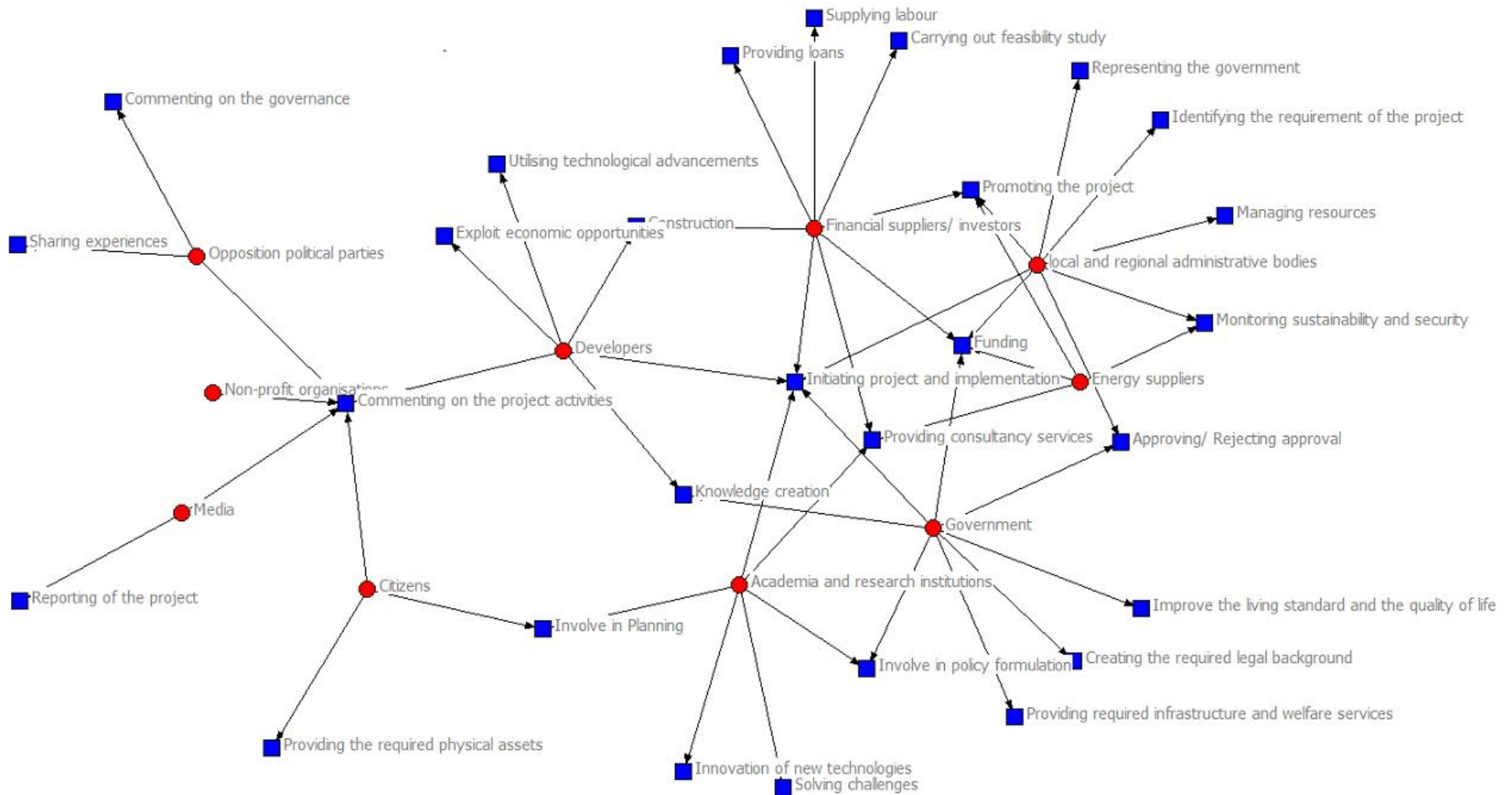
Figure 4.1: Mapping of stakeholders and their contributions in SCPs

4.5   Intermediate Model

A revised model was developed subsequently to the comparison of the findings of newspaper analysis and the literature. The ten stakeholders are presented as internal and external stakeholders and their contributions are also stated in the developed revised model. The revised model is presented in Figure 4.1.

4.6   Chapter summary

In this chapter findings of the desktop review regarding the stakeholders in UDPs and their contributions is presented and compared with the findings of the literature review. Accordingly, stakeholders of a SCP was determined and the identified stakeholders were categorised as internal and external stakeholders. Finally, in accordance with the findings, the conceptual model was revised and presented in this chapter.

Stakeholders and Their Contributions for SCPs – Stage 2 (Literature Review + Desktop Study)

Government
- Decision making
- Initiating project and implementation
- Providing required infrastructure and welfare services
- Knowledge creation and capitalisation
- Creating the required legal background
- Improve the living standard and the quality of life citizens
- Involve in policy formulation
- Approving/ Rejecting approval
- Monitoring sustainability
- Promoting the project
- Communicating with media
- Solving challenges

Local and regional administrative bodies
- Initiating project and implementation
- Identifying the requirement of the project
- Promoting the project
- Managing resources
- Monitoring sustainability and security
- Approving/ Rejecting approval
- Representing the government
- Funding

Financial suppliers/ Investors
- Funding
- Construction
- Providing consultancy services
- Initiating project and implementation
- Carrying out feasibility study
- Promoting the project
- Providing loans
- Supplying labour
- Planning

Developers
- Contributing with knowledge and services
- Utilising innovation and technological advancements
- Exploit economic opportunities
- Initiating project and implementation
- Commenting on the project activities

Utility suppliers
- Providing Sustainable energy supply Funding
- Promoting the project
- Handling the project
- Providing consultancy services
- Development

Smart City Project

Citizens
- Engaging in decision making
- Providing positive and negative views on the project
- Providing the required physical assets

Media
- Reporting problems and the advantages of the project
- Questioning on the development of the project

Non-profit organisations
- Commenting on the project activities

Political Institutions
- Sharing their experiences
- Commenting on the governance
- Commenting on the project activities

Academia and Research Institutions
- Initiating the project
- Providing advices
- Solving challenges
- Guide in policy formulation
- Involved in planning of the project
- Innovation of new technologies

- *Internal Stakeholders*   - *External Stakeholders*   - *Contributions*

Figure 4.2: Intermediate model

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5.0 CHAPTER 5: DATA ANALYSIS AND FINDINGS: CASE STUDY

5.1 Introduction

In this chapter, analysis of the collected data from the case study is presented. Details of the case study and the findings derived are presented in the subsequent sections of the chapter. Captured data from the case study was analysed by utilising the content analysis technique.

5.2 Details of the Case Study

Single case study was selected due to the unavailability of SCPs in Sri Lanka. From the case study, stakeholders of the SCP, which were identified through the desktop study were validated and their contributions in SCPs were further investigated.

5.2.1 Data collection techniques

Data from the case study was captured through nine (9) semi structured interviews among the project team members. The selected respondents were interviewed according to a semi structured interview guideline, which consisted with three (3) sections. In section A, background information of the interviewee were captured. Stakeholders of the SCPs were investigated from the data collected from section B. Section C captured data regarding the current status of the engagement of stakeholders in SCPs and the section D captured data regarding the contributions of the stakeholders in SCPs and regarding the factors ensuring the engagement of stakeholders in SCPs.

5.2.2 Profile of the interview respondents

The interviewees were selected from the project team members of the selected case. The profile of the sample of the stakeholders of the case is presented in Table 5.1.

Table 5.1: Analysis of the profiles of the interviewees

Experience	Number of interviewees	Interviewees
0-5 years	0	-
6-10 years	1	I6
11-15 years	3	I3, I5, I9
16-20 years	3	I4, I7, I8
21-25 years	2	I1, I2

The graphical representation of demographic information is illustrated in Figure 5.1.
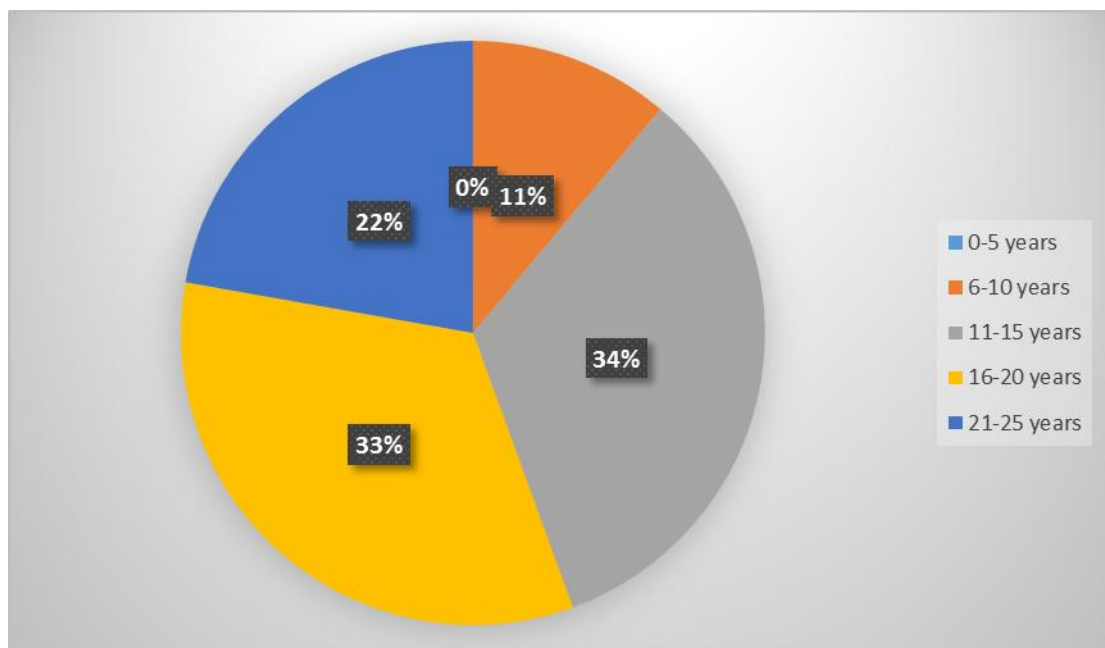
Figure 5.1: Demographic information of the respondents

Through the analysis of the demographic information of the interviewees it can be determined that all the respondents have more than 9 years of experience in the field. 89% of the respondent had experience more than 10 years.

5.3   Current status of SCPs in Sri Lanka

Through the opinions of all nine (9) respondents, it can be determined that the concept of SCs is novel to Sri Lanka. Though, all the respondents stated that, with the emerging

requirement of SCs for Sri Lanka, the concept of SCs have generated a big excitement. According to a project consultant (I3), "*SC development in Sri Lanka is at a primary stage. Hambanthota is identified as a city with a possibility of converting into a SC*". However, I5 and I9 stated that possibility of a SC is available only in the selected case of this research. Furthermore, a project consultant (I7) indicated that "*implementation of SC initiatives are at the primary stage*". According to the Project's Deputy Director (I2), "*rapid urbanisation in city areas will accelerate the implementation of the smart initiatives in Sri Lanka*". Therefore it can be determined that, initiation and implementation of SCPs are at a primary stage in Sri Lanka. Though, development of SCPs is accelerated due to the challenges arise with the rapid urbanisation.

5.4 Stakeholder engagement in SCPs in Sri Lanka

As stated by all nine (9) respondents, in SCPs in Sri Lanka, there is no procedure followed in managing the stakeholders of the project. According to I3, "*managing stakeholders is at pre mature stage*". Moreover, I3 stated that there is no satisfied procedures are being followed in managing stakeholders. Moreover, the Project Director (I1) indicated that there is no established system in stakeholder management in SCPs in Sri Lanka. Therefore, the requirement of an established system in managing stakeholders in SCPs can be identified.

When considering about the procedure followed in engaging the stakeholders in the project, all the respondents except I7 stated that the current procedure is to follow the agreements. I7 stated "*engaging stakeholders is carried out by checking the compliance with the rules and regulations*". All the respondents agreed that the current procedure followed in engaging the stakeholders in the projects is not at the satisfactory level because there are external stakeholders, where no agreements can be found with them and the project team. Therefore, the importance of identification of stakeholders in a SCP and their contributions in the projects were identified. Furthermore, the factors affecting for effective engagement of stakeholders in a SCP was required to be identified in order to ensure the engagement of stakeholders in the project.

5.5 Types of stakeholders in SCPs in Sri Lanka

All the respondents were agreed with the stakeholders identified from the literature review and from the desktop study. Therefore, the stakeholders identified were validated by the respondents of the case study. According to I6, "*engagement of all the stakeholders effectively in the project is one of the keys for project success*". Accordingly, Government, Local and Regional Administrative Bodies, Media, financial suppliers/ investors, Academia and Research Institutions, citizens, utility suppliers, developers, non-profit organisations and opposition political parties can be identified as stakeholders of SCPs.

5.6 Contributions of stakeholders in SCPs in Sri Lanka

Contributions identified from the literature review and from the desktop study were validated through the case study and further, other contributions of each stakeholder were investigated through the case study. Contributions of the stakeholders in a SCP are presented subsequently.

5.6.1 Contributions of Government

All the respondents were agreed with the findings of the literature review and desktop study regarding the contributions of the Government. According to I3, a considerable large contribution of the Government can be identified in a SCP. I6 also stated that the effective engagement of the Government in the project, motivates the other stakeholders as well.

Through the findings of the case study, more contributions of the Government in a SCP were identified. I7 stated "*accelerating infrastructure development and managing and monitoring security of the data systems is a required contribution of the Government in a SCP*". Furthermore, I3 and I6 also stated that, introduction of fast track program conduction methodologies by the Government is an important contribution required from the Government. Moreover to the respondents, coordination among the stakeholders in a SCP was also identified as a contribution of the Government. According to I5 and I4, coordination among the stakeholders is essentially required for the success of the SCP. Therefore, introducing fast track

project implementation strategies, coordinating stakeholders and managing and monitoring security of the data systems are identified as contributions of Government in SCPs, other than the contributions identified through the findings of Chapter 4.

5.6.2 Contributions of Local and Regional Administrative Bodies

The identified contributions of the Local and Regional Administrative Bodies in Chapter 2 and Chapter 4 were validated by the respondents. All the respondents agreed with the identified contributions of Local and Regional Administrative Bodies in a SCP. More contributions of Local and Regional Administrative Bodies were also identified through the case study.

I2 stated that checking the viability of the approvals and monitoring sustainability are the existing contributions of Local and Regional Administrative Bodies. According to I7, bringing new technology is an important contribution of Local and Regional Administrative Bodies. Moreover, I7 stated that rebuilding tax regulations in favour to SC development is an important contribution required. I8 highlighted the requirement of providing guidelines for quality maintenance in SCPs. I5 stated "*involve in policy making by Local and Regional Administrative Bodies attract foreign investors*". Therefore, it can be identified that involve in policy making as an important contribution of Local and Regional Administrative Bodies. Accordingly, checking the viability of the approvals, bringing new technology, infrastructure development, involve in policy development and providing guidelines for quality maintenance are identified as the other contributions of the Local and Regional Administrative Bodies in SCPs.

5.6.3 Contributions of Media

In capturing data regarding contributions of Media in SCPs, it was identified promoting the project as a current contribution of Media, which is stated by I3. Other potential contributions of Media in SCPs for the success of the project were also identified. According to I7 and I9, contributions of Media should include utilising technological advancements and communicating effectively with the public. All the

respondents stated that Media shall educate and provide correct information to the public and to foreign countries. Therefore, promoting the project, educating the public and utilising technological advancements are the other identified contributions of Media in SCPs.

5.6.4 Contributions of financial suppliers/ investors

Through the case study, the identified contributions of financial suppliers/ investors were validated and all the respondents agreed with the findings regarding contributions of financial suppliers/ investors, which were gained through comparison of the findings of the literature review and the desktop study. According to I2 and I9, public infrastructure development through getting into partnerships is an important contribution of the financial suppliers/ investors. Moreover to the findings of the case study, building partnerships with the developers to identify the requirements of the smart initiatives and projects was identified as another contribution of financial suppliers/ investors. As stated by I4, "*development of the facilities required in SCPs through building partnerships with the developers and introducing new technology will enhance the SCP*". Therefore developing partnerships, infrastructure development and bringing new technology can be also identified as other contributions of financial suppliers/ investors in SCPs.

5.6.5 Contributions of Academia and Research Institutions

The findings regarding the contributions of Academia and Research Institutions were validated through the case study. Moreover, the importance of conducting more research publications was highlighted by I3, I7 and I4. I2 stated "*carrying out research and development will always enhance the SCP success*". Furthermore, it was stated that the funding on the research and development as another contribution of Academia and Research Institutions in a SCP. Accordingly, conducting studies and monitoring project activities, conducting research publications and investing on the research and development are identified as the other contributions of Academia and Research Institutions through the case study.

5.6.6 Contributions of citizens

All the respondents validated the contributions of citizens identified and suggested other potential contributions of the citizens. In analysing the findings regarding the contributions of citizens in SCPs, other than the identified contributions in Chapter 4 – Section 1, developing the skills and knowledge required and involve in decision making independently were identified as contributions required from the citizens. I3 stated "*the citizens should not depend on others in decision making regarding SCPs*". Moreover, I1 indicated that SCPs shall have citizen centric decision making as citizens are going to live in the SC. Therefore, generating requirements, being aware on the project activities, developing the knowledge and skills required and showing interest regarding project implementations are the other contributions of the citizens in SCPs.

5.6.7 Contributions of utility suppliers

Through the opinions of the respondents, the identified contributions of the utility suppliers in SCPs were validated. According to all the respondents, promoting sustainable utility supply is an important contribution of the utility suppliers. I3 stated that, "*encouraging the project developers in using sustainable energy and utilities is a significant contribution of the utility suppliers*". Furthermore, I2 indicated that the utility suppliers shall bring new technology and utilise them in the SCP. Accordingly, utilising new technologies and encouraging developers in achieving sustainable development are the identified contributions through the case study.

5.6.8 Contributions of developers

The nine respondents validated the contributions of the developers and further stated that potential contributions of the developers in a SCP. The respondents highlighted that the developers shall contribute more in infrastructure development. Furthermore, utilising new technology was identified as a contribution by I1 and I7. In contrast, I2 stated that the developers are using new technologies in the development stage of the SCP. Therefore, promoting and utilising the use of technological advancements is the contribution of the developers identified through the case study.

5.6.9 Contributions of non-profit organisations

The opinion of the respondents verified that the contribution of non-profit organisations identified. Moreover, all the respondents indicated that the non-profit organisation shall be self-motivated on the project activities. I4 stated "*non-profit organisations shall not work under any political party in decision making regarding project activities*". I7 highlighted identifying the current requirements of the public and giving awareness to the public as contributions of the non-profit organisations in SCPs. Moreover, I2 and I3 stated transferring correct information and communicating with the public as contributions of non-profit organisations. Accordingly, protecting public interest, communicating with the public, monitoring the applications, identifying the current requirements and providing attention on sustainable development

5.6.10 Contributions of opposition political parties

In the validation of the identified contributions of opposition political parties, eight respondents indicated that the opposition political parties do not share their experiences. I7 stated "*sharing experiences is a required contribution of opposition political parties, which is not happening in the current situation*". The other contributions were validated by all the respondents. Other than the identified contributions, influence the Government on improving transparency in decision making was identified as a contribution required from the opposition political parties in a SCP.

5.7 Factors ensuring the engagement of stakeholders in SCPs in Sri Lanka

Factors ensuring the engagement of Government

Six (6) respondents stated that the current contribution of the Government was satisfying the requirement. Though I3 stated that, the actual potential contribution of the Government is not given in the current situation. When the Government is not engaging in the project as required, it was identified that delays in project implementation and required to pay delay costs. Moreover I3 stated that it is important to develop infrastructure required for the project in the required speed. Therefore, to

ensure the engagement of stakeholders in SCPs, political stability, transparency, effective coordination and policy development were identified as the required factors. I7 stated that political stability and transparency is essential to ensure the engagement of the Government in SCP effectively. Therefore, it was identified that policy development, transparency, political stability and effective coordination are required in ensuring the engagement of the Government in SCPs.

Factors ensuring the engagement of Local and Regional Administrative Bodies

All the respondents indicated that the current contribution of the Local and Regional Administrative Bodies are not adequate for the success of the SCP. I7 stated that, delays in infrastructure development and thereby delays in the SCP can be identified as the results of ineffective contribution of Local and Regional Administrative Bodies. I2, I3 and I7 identified that providing the required legal background would ensure the engagement of the Local and Regional Administrative Bodies. Moreover, I1 and I4 indicated that, eliminating political influences, determining the boundary of engagement and capacity building as the other factors, which ensure the engagement of stakeholders in a SCP. Accordingly, providing the required legal background, capacity development, effective coordination, eliminating political influences and determining the boundary of engagement are identified as the factors ensuring the engagement of Local and Regional Administrative Bodies in SCPs.

Factors ensuring the engagement of Media

Through the opinions of the respondents, Media's contribution in SCPs is also not adequate. I3 stated "*lack of communication with the public and wrong transformation of information to the public result in public protests regarding the project's activities*". Therefore, the respondents suggest the developers to have frequent meetings with Media to engage Media towards the project. Moreover, I2 and I5 indicated that giving awareness regarding the project activities and providing the required technological advancements will also ensure the engagement of Media in the SCP. Accordingly, bringing new technological advancements, encouraging the developers to have frequent meetings with Media and giving awareness regarding the project are identified as the factors ensuring the engagement of Media.

Factors ensuring the engagement of financial suppliers/ investors

In accordance to the respondents, the engagement of the financial suppliers/ investors could be ensured by developing the required policies and by facilitating with the required legal background. I8 stated "*development of the required policies attract the financial suppliers/ investors towards the project*". Moreover to the respondents of the case study, improving the facilities, providing tax benefits to the financial suppliers/ investors and introducing new technology would ensure the engagement of financial suppliers/ investors to the project. According to I6, infrastructure development in the country, attract foreign country's attention in investing on the SCPs. Therefore, development of the required policies, providing the required legal background, improving facilities, infrastructure development, providing tax benefits and introducing new technology are the identified factors ensuring the engagement of the financial suppliers/ investors in SCPs.

Factors ensuring the engagement of Academia and Research Institutions

Opinions of the respondents of the case study indicates that the ineffective contribution of the Academia and Research Institutions results in less attractiveness to the projects and may result in public protests as well. Therefore, I2 stated "*identification of the contribution requirement from Academia and Research Institutions takes an important place*". Moreover to the I2, I9 and I4, it was identified that providing the required legal background, improving the funding for research and development regarding SCPs and improving the facilities in Academia and Research Institutions would ensure the engagement of Academia and Research Institutions in SCPs. Accordingly, providing the required legal background, identification of the contribution requirements, improving facilities and improving funding for research and development are the identified factors ensuring the engagement of Academia and Research Institutions.

Factors ensuring the engagement of citizens

In accordance with the respondents, citizens are not interested in finding the true information about the SCPs. As a result, public protests could be occurred and due to them, project delays could occur. According to I5, citizens shall involve in the decision making process and it is important to address the comments on the project by the

citizens. Moreover to I5, citizen centred problem solving and developing facilities ensure the engagement of the citizens in SCPs. I2 highlighted the requirement of ensuring human rights in order to engage the citizens. Furthermore, I9 indicated that the required resources for capacity building shall be given to the citizens. Therefore, supplying the required resources for capacity building, developing facilities, ensure human rights, citizen centric problem solving, promoting the project and involving citizens in decision making are the factors ensuring the engagement of the citizens in SCPs.

Factors ensuring the engagement of utility suppliers

The respondents of the case study stated that, with the ineffective contributions of the utility suppliers, project delays could occur. To ensure the engagement of the utility suppliers in SCPs, I7 highlighted the requirement of bringing new technology. Moreover to the respondents, it was identified that the development of the required policies and development of the legal background would ensure the engagement of the utility suppliers. According to I2, providing political stability would also ensure the engagement of the utility suppliers in SCPs. Accordingly, providing the required legal background, required policy development, updating knowledge, developing facilities and bringing new technology are the factors, which ensure the engagement of the utility suppliers.

Factors ensuring the engagement of developers

According to the respondents, currently, accurate development according to the time frame of the project can be determined. Though I3 stated that the developers could engage in the project more effectively. I1 stated "*the developers are an important stakeholder category in a SCP, where the effective engagement of the developers is the key for the success of the project*". Through the analysis of the findings of the case study, required policy development, providing the required legal background, bringing new technology, updating knowledge and developing the facilities would ensure the engagement of the developers in the SCP.

Factors ensuring the engagement of non-profit organisation

Protecting the public interest is the identified role of the non-profit organisations, through the analysis of the captured data of the case study. Though, the currently identified challenges in the engagement of the non-profit organisations include the influence make by the political parties. I3 stated *"because of the political influence, the non-profit organisations are trying to create a bad image on the project, which will affect the development of the project"*. Therefore, to ensure the engagement of the non-profit organisations, providing the required legal background, awareness regarding the project and ensuring the human rights are the factors identified through the case study.

Factors ensuring the engagement of opposition political parties

The respondents of the case study stated that the opposition parties are providing the solutions only after problems arise in the project, which should be avoided to be effectively engage in the SCP. To ensure the effective engagement of the opposition political parties, I7 suggest to improve the political stability. Moreover, all the respondents stated that, providing the required legal background is necessary for the engagement of opposition political parties in the SCP. Therefore, to ensure the engagement of opposition political parties, it is required to provide the required legal background and political stability.

5.8 Chapter Summary

Stakeholders identified through the comparison of the findings of the desktop study and the literature review were validated under this chapter. Further, the identified contributions of each stakeholder were validated and more contributions of the stakeholders were identified through the findings presented in this chapter. Moreover, factors ensuring the engagement of stakeholders in SCPs were depicted in this chapter.

6.0 MODEL DEVELOPMENT AND VALIDATION

6.1 Introduction

Through the findings of the literature review, desktop study and the case study, a model was developed in order to achieve the aim of this research, which is to enable the engagement of stakeholders in SCPs in Sri Lanka. Under this chapter, the stages in model development and the developed model is presented. Subsequent to the model development, validation of the model was carried out.

6.2 Model Development

Model development was carried out in three main steps.

Step 1: Identification of the stakeholders in SCPs

Initially, stakeholders in SCPs were identified through the literature review. Subsequently, stakeholders in UDPs in Sri Lanka were determined through a newspaper analysis in the last 5 years. Afterwards, the identified stakeholders from the literature review and the desktop study were compared and stakeholders in SCPs were identified. These stakeholders were validated through the case study. Furthermore, the stakeholders were categorised as internal and external stakeholders. According to the findings of the desktop study, the importance of stakeholders are presented in Figure 6.1. Internal and external stakeholders are illustrated in 2 different colours. The importance of internal and external stakeholders in SCPs are separately denoted by the size of the oval.

Step 2: Identification of the contributions of the stakeholders in SCPs

Contributions of the stakeholders in SCPs were initially identified through the literature review. Further, contributions of the stakeholders in UDPs in Sri Lanka were identified through the desktop study and the findings were compared with the findings of the literature review. Accordingly, contributions of each stakeholder were listed out and through the case study, those contributions were validated and more contributions

were identified. Finally, the identified contributions were categorised as specific contributions of each stakeholder and as common contributions.
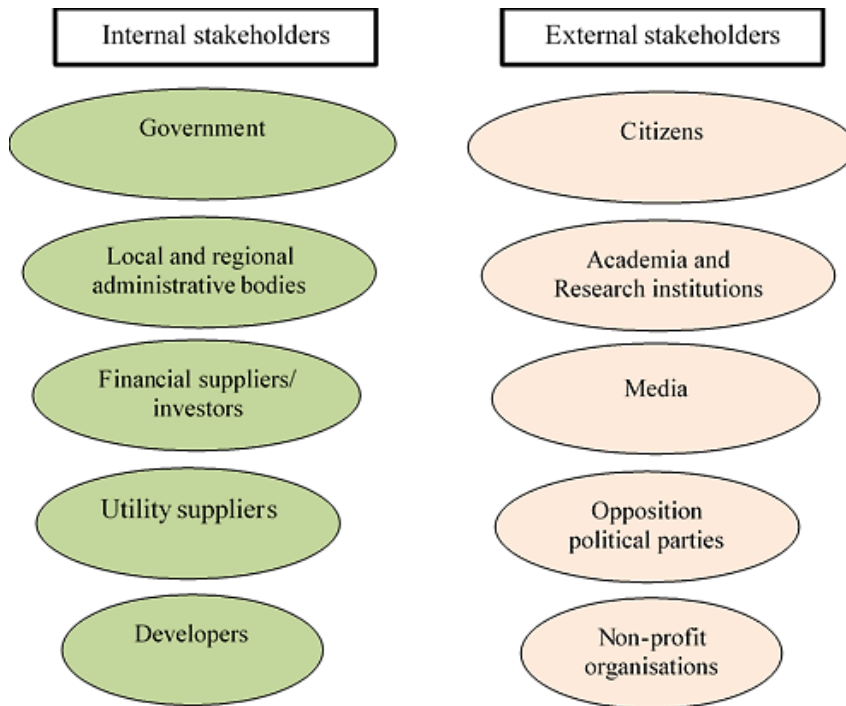
Figure 6.1: Importance of the stakeholders

Step 3: Identification of the factors ensuring the engagement of stakeholders in SCPs

Through the findings of the case study, factors ensuring the engagement of stakeholders in SCPs were identified.

In the developed model, internal and external stakeholders of a SCP, specific contributions of the stakeholders and common contributions in a SCP and the factors ensuring the engagement of the stakeholders in a SCP are illustrated and linked accordingly. Figure 6.2 presents the developed model in order to achieve the research aim of the study.
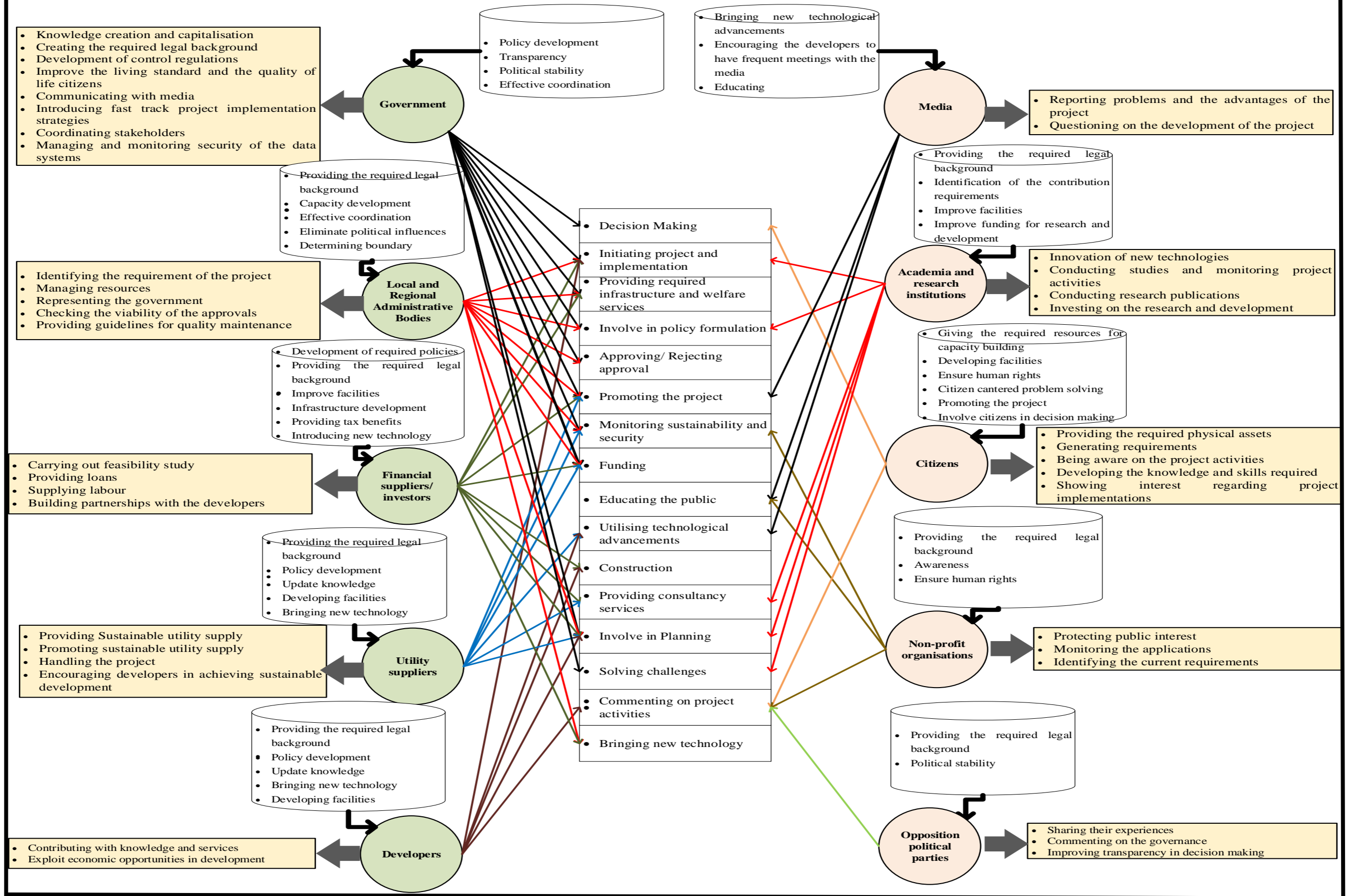
Figure 6.2: Developed model

90

6.3 Model Validation

The developed model was validated through an expert survey. The sample of the expert survey and the findings are presented in the subsequent sections.

6.3.1 Profile of the respondents of the expert survey

Model validation was carried out through a questionnaire survey among five experts among the stakeholders of the SCP. The questionnaire is attached in Appendix 'C'. The graphical representation of demographic information of the respondents of the expert survey is illustrated in Figure 6.3.
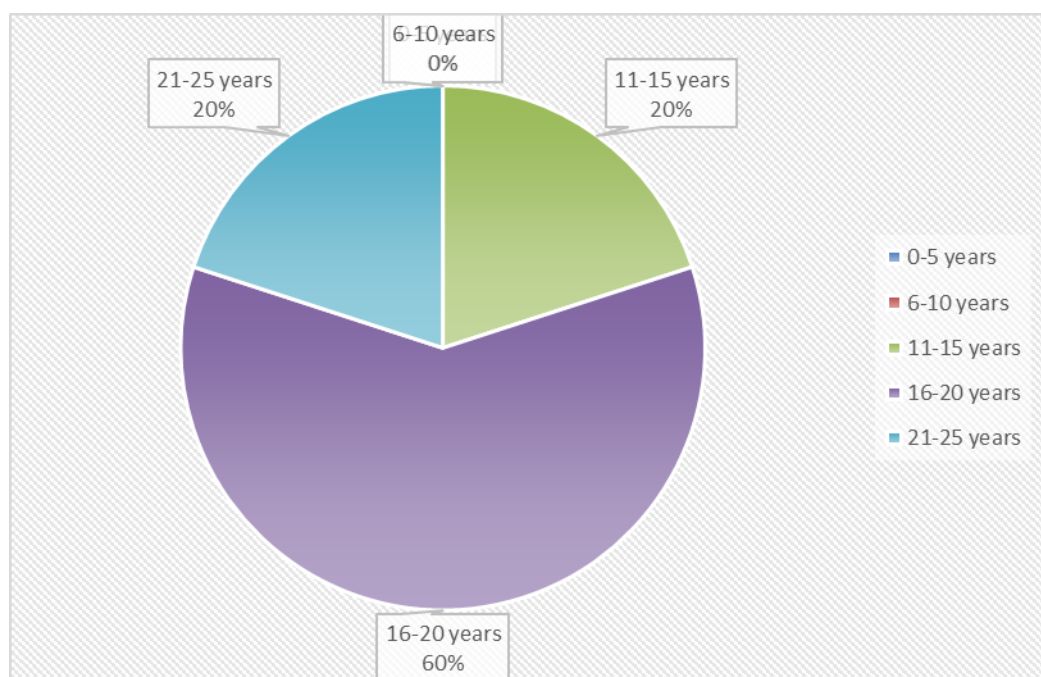
Figure 6.3: Demographic information of the respondents of the questionnaire survey

Through the analysis of the demographic information presented in Figure 6.3, it could be determined that all the respondents have more than 13 years of experience and 60% of the respondents are have experience between 16-20 years.

6.3.2 Findings of Model Validation

Through the conducted questionnaire survey, model validation was carried out. Validation was carried out regarding the content, clarity, understanding, appropriateness and applicability of the developed model. The results of model validation are presented in Table 6.1.

Table 6.1: Results of model validation

Respondent / Criteria	EI 1	EI 2	EI 3	EI 4	EI 5
Content	Outstanding	Satisfactory	Outstanding	Outstanding	Outstanding
Clarity	Outstanding	Satisfactory	Outstanding	Outstanding	Satisfactory
Understanding	Outstanding	Outstanding	Outstanding	Satisfactory	Satisfactory
Appropriateness	Satisfactory	Moderate	Outstanding	Satisfactory	Moderate
Applicability	Outstanding	Moderate	Satisfactory	Satisfactory	Satisfactory

Through analysis of the expert survey for validation, it can be identified that the content of the model is identified as outstanding by four respondents and 1 expert have identified it as satisfactory. The clarity and the understanding of the model was identified as outstanding by three experts. When considering the appropriateness and the applicability of the model, one expert stated that it is outstanding. None of the respondents stated that the content, clarity, understanding, appropriateness and applicability of the developed model as unsatisfactory or poor.

6.3.3 Further Improvements

The respondents stated that, there is a requirement in developing a computer based model to evaluate the engagement of the stakeholders in a SCP. According the respondents, a computer based model would be more user friendly and easy to generate results. Moreover, the respondents indicated the necessity of developing the key performance indicators to measure stakeholder engagement in SCPs. That will guide in evaluating the engagement of stakeholders in the project.

6.4   Chapter Summary

In this chapter, data collected from the case study was analysed using the manual content analysis technique. Stakeholders and their contributions in SCPs and the factors ensuring the engagement of stakeholders in a SCP were identified. The findings were presented in a model and the findings of the model validation are also presented in this chapter. Accordingly, the third objective of the research was achieved.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

Concluding the findings of the research is the aim of this chapter. A summary of the research and conclusions drawn from the research is presented. Furthermore, contribution to knowledge and recommendations for industry practitioners and for academic research are also provided.

7.2 Overview of the Research

With the challenges arise through rapid urbanisation, the current world is interested in initiating SCs. Though there is a growing requirement in initiating SCs, SCPs entails challenges, which are required to be overcome for the success of the project. To overcome these challenges, stakeholder management was identified as the ideological solution. In the stakeholder management process, enabling engagement of stakeholders was identified as a key for success in a project. The research aim and objectives were developed in order to pursue the above mentioned requirement.

The research was conducted under explanatory sequential mixed approach and data was collected through a desktop study and a case study. The desktop study was carried out through newspaper analysis of two (2) newspapers for five (5) years from October, 2018 to November, 2013. Findings of the desktop study were quantitatively analysed and the data captured through the case study was analysed using the manual content analysis technique. According to the findings, a model was developed and was validated by five (5) experts among the stakeholders of the SCP.

7.3 Key Research Findings

Subsequent sections are presenting the conclusions of the research findings.

7.3.1 Objective 1 - To review the concepts, characteristics and stakeholder engagement in SCPs for SUD

Through a comprehensive literature survey, the concept of SC was reviewed and a definition for SC was developed. In this research, SC is defined as,

"A multidisciplinary concept that connects technological factors, institutional factors and human factors in order to achieve a greener city with higher quality of life and sustainable economic growth".

Institutional factors, technological factors and human factors were identified as the key dimensions of the SC and the initiative factors under each dimension was identified. It was identified that various characteristics of SCs have been modelled and they were reviewed. Viewing the requirements of the citizens and, adopting strategic and integrated planning in designing SC were identified as the special characteristics of SCPs. Moreover, sustainability, quality and urbanisation by means of smartness are other characteristics of SCPs. Similar to the other UDPs, it was identified that the SCPs are also dealing with constraints, resources, uncertainty and complexity. Furthermore, SCs were identified as an ideological solution for achieving SUD. To overcome the challenges in initiating SCs, importance of the stakeholder engagement concept was reviewed through the literature survey.

7.3.2 Objective 2 - To investigate the types of stakeholders and their contributions in SCPs in Sri Lanka

Through the literature survey, thirteen (13) stakeholders and their contributions in SCPs were identified. Furthermore, a desktop study and a case study was carried out in order to identify the stakeholders and their contributions in SCPs in Sri Lanka. Through the comparison of the stakeholders identified in the literature review and from the newspaper analysis, ten (10) stakeholders and their contributions in SCPs were identified. From the case study, the identified stakeholders through the findings of the desktop study and the literature review were validated. The contributions of the stakeholders were also validated by the respondents of the case study and more contributions were added by the respondents. Accordingly, a final list of stakeholders and their contributions in SCPs in Sri Lanka were identified. The stakeholders were

categorised as internal and external stakeholders in accordance with the characteristics of internal and external stakeholders identified through the literature review. Government, local and regional administrative bodies, financial suppliers/ investors, utility supplliers and developers were identified as the internal stakeholders in SCPs whereas, citizens, academia and research institutions, media, opposition political parties and nion-governmental organisations were identified as external stakeholder in SCPs.

7.3.3 Objective 3 - To develop a model for enabling effective engagement of stakeholders in SCPs in Sri Lanka

In the model development, internal and external stakeholders were presented separately and the contributions of the stakeholders were divided into common contributions and specific contributions for each stakeholder. The factors ensuring the engagement of each stakeholder in SCPs in Sri Lanka was identified through the case study. Finally, a model was developed for enabling the engagement of stakeholders in SCPs in Sri Lanka. Moreover, the model was validated through an expert survey.

Through the research it was identified that the requirement of SCs is growing at an amazing pace with the complexities in modern cities, which are due to the rapid urbanisation. In the Sri Lankan context, implementation of SCs and the smart initiatives are at the initial stage. Though there are some cities that have been selected as to be developed as smart cities, only one project can be determined as a SC development project. Moreover, limited number of publications can be identified regarding the concept of SCs in Sri Lanka. As SCs are multi stakeholder eco systems, engagement of the stakeholders in the SCPs are significant for the success of the projects. Therefore, enabling the engagement of stakeholders in SCPs enable the initiation of SCs in Sri Lanka.

7.4 Scope and limitations

The scope of this research was to enable the engagement of stakeholders in SCPs in Sri Lanka. The scope of the research was successfully covered by developing a model enabling the engagement of stakeholders in SCPs in Sri Lanka. Due to the time

constraint, two newspapers were reviewed and analysed. Due to the availability of only one SCP in Sri Lanka, the study was limited to one case study.

7.5 Contribution to Knowledge

This research mainly contributes to knowledge regarding stakeholder engagement in SCs. The outcome of the research can be used to enlighten the knowledge in following ways.

- Identification and understanding of the concept of SCs, characteristics of SCPs
- Identification of stakeholders and their contributions required for effective engagement of stakeholders
- Identification of the strategies ensuring effective engagement of stakeholders
- Development of a model for ensuring effective engagement of stakeholders

7.6 Recommendations for Industry Practitioners

Outcomes of this research would be beneficial for the industry practitioners involved in SC development in Sri Lanka. The following are the recommendations for the industry practitioners gained through this research.

- Facilitating a basis for investigating the current level of engagement of stakeholders in SCPs
- Assisting decision makers in stakeholders management in SCPs
- Formulating strategies for ensuring effective engagement of stakeholders

7.7 Recommendations for Academic Research

The research was limited on developing a model enabling stakeholder engagement in SCPs. Wide scope of stakeholder management in SCPs could lead to the research schemes mentioned below.

- Investigating on the contributions of the stakeholders linking to the project lifecycle
- Developing a performance measurement system for effective engagement of stakeholders

7.8   Chapter Summary

An overview of the entire research is presented under this chapter. In order to pursue the first objective, chapter 2 mainly contributed. The second objective was achieved through the contribution of Chapter 2, 4 and 5. The final objective was achieved from Chapter 5. It was revealed that the developed model is important and can be successfully implemented in enabling the engagement of stakeholders in SCPs in Sri Lanka. This chapter provided the contributions for the enhancement of knowledge from the research and by recommendations for industry practitioners and for academic research.

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9.0 ANNEXURES

Appendix 'A': Contributions of the Stakeholders Identified From the Desktop Study

Stakeholder → / Influence/contribution ↓	Government		Media		Ports Authority		UDA (UD Authority)		Ministry of Megapolis and Western		Central Environmental Authority (CEA)		Citizens		Energy authorities		Private sector financial institutions		Foreign investors		Foreign contractor organisations		Foreign consultant organisations		Ministry of Environment		Electricity Board (CEB)		National water supply and drainage board		Irrigation department		Local Contractors		Municipal Councils		National Aquatic Resources Research and Development		Coast Conservation Department (CCD)		Ministry of Highways, Ports and Shipping		Board of Investment		Public Utilities Commission		Chamber of Construction Industry		Academia and Research Institutions		Road Development Authority		NGO	
	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank
Decision making	2.07	5																																																				
Funding	2.76	4															8.97	1	28.97	1							0.69	1															0.69	2										
Finalising the legal framework	5.52	2																																																				
Initiating project and implementation	28.28	1			2.07	1	1.38	2	2.07	3									2.07	2									0.69	2					0.69	1					2.07	1									1.38	1		
Planning	4.14	3			2.07	1			2.07	3															0.69	4																													
Pay compensation	1.38	6																																																				
Implementing PPP	2.76	4																																																				
Inspection	1.38	6																																																				
Obtaining environmental improvements	0.69	7																																																				
Monitoring sustainability	2.07	5							0.69	5	2.07	1													0.69	1															2.76	2									0.69	1		
Getting the registrations	0.69	7																																																				
Promoting the project	0.69	7					0.69	3													1.38	3					0.69	1																										

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Expedite the process	0.69	7

Stakeholder → / Influence/contribution ↓	Government		Media		Ports Authority		UDA (UD Authority)		Ministry of Megapolis and Western		Central Environmental Authority (CEA)		Citizens		Energy authorities		Private sector financial institutions		Foreign investors		Foreign contractor organisations		Foreign consultant organisations		Ministry of Environment		Electricity Board (CEB)		National water supply and drainage board		Irrigation department		Local Contractors		Municipal Councils		National Aquatic Resources Research and Development		Coast Conservation Department(CCD)		Ministry of Highways, Ports and Shipping		Board of Investment		Public Utilities Commission		Chamber of Construction Industry		Academia and Research Institutions		Road Development Authority		NGO	
	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank
Negotiating with the contractors	0.69	7																																																					
Providing advices	0.69	7													1.38	1			2.07	2																														3.45	1				
Approving/ Rejecting approval	0.69	7									2.07	1																												4.14	1												
Identifying the requirement of the project	0.69	7																																				0.69	1															
Reporting																																												0.69	2									
Questioning on the development of the project			2.07	1																																																			
Make a hue and cry on the cost of the project			0.69	2																																																			
Coming up with proposals					2.07	1			0.69	5																													1.38	1														
Provide reasoning for the project					0.69	2																																																	
Handling the project					2.07	1	2.07	1																			0.69	1																											
Conducting EIA					0.69	2					2.07	1																												0.69	2												
Communicating with Media					2.07	1			3.45	1																																	0.69	2									
Representing the Sri Lankan Government							0.69	3																																															
Coordinating							0.69	3																					0.69	3																					0.69	2		
Acquisition of lands required for the project									0.69	5																																													

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Influence/contribution	Government		Media		Ports Authority		UDA (UD Authority)		Ministry of Megapolis and Western		Central Environmental Authority (CEA)		Citizens		Energy authorities		Private sector financial institutions		Foreign investors		Foreign contractor organisations		Foreign consultant organisations		Ministry of Environment		Electricity Board (CEB)		National water supply and drainage board		Irrigation department		Local Contractors		Municipal Councils		National Aquatic Resources Research and Development		Coast Conservation Department(CCD)		Ministry of Highways, Ports and Shipping		Board of Investment		Public Utilities Commission		Chamber of Construction Industry		Academia and Research Institutions		Road Development Authority		NGO	
	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank	Percentage	Rank
Solving challenges									1.38	4																					0.69	4															1.38	2				
Administrative actions							0.69	3	2.76	2																																	1.38	1										
Contributing by giving lands													4.14	1																																							
Protesting against the project													2.76	2																																						0.69	1
Providing loans																	0.69	2																																			
Construction																					13.79	1											2.06	2																	0.69	2		
Carrying out feasibility study																					2.07	2																																
Providing consultancy services																							6.21	1			0.69	1																										
Supplying labour																			0.69	2																																		
Contributing with knowledge and services																											0.69	1	1.38	1	0.69	1	4.14	1																				
Commenting on the project activities																																							0.69	2	2.07	3											0.69	1		

Appendix 'B': Interview Guideline

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xxxxxxxxxxxx,
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………………………..,
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………………………..,

Dear Sir/ Madam,

<u>**Interview Guideline for Dissertation – M.Sc. by Research Degree**</u>

I am a postgraduate student of University of Moratuwa reading for Masters of Science (by Research). In fulfilment of this degree, the students are required to study as a full-time research and produce a report on their study. The focus of my research is to ***develop a model to enable the engagement of stakeholders in SCPs.*** The research is carried out under the supervision of xxxxxxxxxxxxxxx and xxxxxxxxxxxxxxxxxxxxxx.

This interview guideline will be distributed to the professionals of SC development projects. The confidentiality of the organization as well as the participants will be maintained throughout the research and the identities of the participants will not be revealed in any document or event relating to this study. I hereby certify that the information collected from this interview will be used only for fulfilling the research aim. I would be grateful if you could participate in this interview.

Thank you,
Yours faithfully,

xxxxxxxxxxxxxxxx,

SECTION A- BACKGROUND INFORMATION OF THE INTERVIEWEE

Name of the respondent (optional): …………………………………………………

Designation: ………………………………………………………………………….

Organisation (optional): …………………………………………………………...

Experience in the field:……………………………………………………………….

SECTION C- ENGAGEMENT OF STAKEHOLDERS

1. What is the current status of SC development projects in Sri Lanka?
   …………………………………………………………………………………
   …………………………………………………………………………………

2. Is there any procedure followed in managing the stakeholders?
   …………………………………………………………………………………
   …………………………………………………………………………………

3. Currently, what is the procedure followed in engaging stakeholder towards the success of the project?
   …………………………………………………………………………………
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SECTION C- CONTRIBUTIONS OF THE STAKEHOLDERS

Contributions of the Government

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Government	Initiating project and implementation		
	Providing required infrastructure and welfare services		
	Knowledge creation and capitalisation		
	Creating the required legal background		
	Improve the living standard and the quality of life citizens		
	Involve in policy making		
	Approving/ Rejecting approval		

1. What are the existing influences / contributions of the Government over the project?

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2. Is the current contribution effective? Yes/ No
   Please provide reasons.

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3. What are the issues faced due to ineffective contribution of the Government?

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4. What are the other potential contributions of the Government required for SC development projects?

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5. What are the suggestions to enhance the engagement of Government for the success of SCPs?

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Contributions of Local and Regional Administrative Bodies

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Local and Regional Administrative Bodies	Initiating project and implementation		
	Identifying the requirement of the project		
	Promoting the project		
	Managing resources		
	Monitoring sustainability and security		
	Approving/ Rejecting approval		
	Representing the Government		
	Funding		

1. What are the existing influences / contributions of Local and Regional Administrative Bodies over the project?

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   ………………………………………………………………………………
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2. Is the current contribution effective? Yes/ No
   Please provide reasons.

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3. What are the issues faced due to ineffective contribution of Local and Regional Administrative Bodies?

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4. What are the other potential contributions of Local and Regional Administrative Bodies required for SC development projects?

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5. What are the suggestions to enhance the engagement of Local and Regional Administrative Bodies for the success of SCPs?

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Contributions of Media

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Media	Reporting problems and the advantages of the project		
	Questioning on the development of the project		

1. What are the existing influences / contributions of Media over the project?

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   ………………………………………………………………………………
   ………………………………………………………………………………

2. Is the current contribution effective? Yes/ No
   Please provide reasons.
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3. What are the issues faced due to ineffective contribution of Media?
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4. What are the other potential contributions of Media required for SC
   development projects?
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5. What are the suggestions to enhance the engagement of Media for the success
   of SCPs?
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Contributions of financial suppliers/ investors

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Financial suppliers/ investors	Funding		
	Construction		
	Providing consultancy services		
	Initiating project and implementation		
	Carrying out feasibility study		
	Promoting the project		
	Providing loans		
	Supplying labour		
	Planning		

1. What are the existing influences / contributions of financial suppliers/ investors over the project?

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2. Is the current contribution effective? Yes/ No
    Please provide reasons.

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3. What are the issues faced due to ineffective contribution of financial suppliers/ investors?

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4. What are the other potential contributions of financial suppliers/ investors required for SC development project?

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5. What are the suggestions to enhance the engagement of financial suppliers/ investors for the success of SCPs?

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Contributions of Academia and Research Institutions

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Academia and Research Institutions	Initiating the project		
	Providing advices		
	Solving challenges		
	Guide in policy formulation		
	Involved in planning of the project		
	Innovation of new technologies		

1. What are the existing influences/ contributions of Academia and Research Institutions over the project?

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2. Is the current contribution effective? Yes/ No
   Please provide reasons.

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3. What are the issues faced due to ineffective contribution of Academia and Research Institutions?

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4. What are the other potential contributions of Academia and Research Institutions required for SC development project?

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5. What are the suggestions to enhance the engagement of Academia and Research Institutions for the success of SCPs?

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Contributions of citizens

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Citizens	Engaging in decision making		
	Providing positive and negative views on the project		
	Providing the required physical assets		

1. What are the existing influences/ contributions of citizens over the project?

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2. Is the current contribution effective? Yes/ No
   Please provide reasons.
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3. What are the issues faced due to ineffective contribution of citizens?
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4. What are the other potential contributions of citizens required for SC development project?
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5. What are the suggestions to enhance the engagement of citizens for the success of SCPs?
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Contributions of utility suppliers

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Utility suppliers	Providing Sustainable energy supply Funding		
	Promoting the project		
	Handling the project		
	Providing consultancy services		

1. What are the existing influences/ contributions of energy suppliers over the project?
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2. Is the current contribution effective? Yes/ No
   Please provide reasons.
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3. What are the issues faced due to ineffective contribution of energy suppliers?

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4. What are the other potential contributions of energy suppliers required for SC development project?

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5. What are the suggestions to enhance the engagement of energy suppliers for the success of SCPs?

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Contributions of developers

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Developers	Contributing with knowledge and services		
	Utilising innovation and technological advancements		
	Exploit economic opportunities		
	Initiating project and implementation		
	Commenting on the project activities		

1. What are the existing influences/ contributions of developers over the project?

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2. Is the current contribution effective? Yes/ No
Please provide reasons.

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3. What are the issues faced due to ineffective contribution of developers?

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4. What are the other potential contributions of developers required for SC development project?

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5. What are the suggestions to enhance the engagement of developers for the success of SCPs?

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Contributions of non-profit organisations

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Non-profit organisations	Commenting on the project activities		

1. What are the existing influences / contributions of non-profit organisations over the project?

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2. Is the current contribution effective? Yes/ No
   Please provide reasons.

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3. What are the issues faced due to ineffective contribution of non-profit organisations?

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4. What are the other potential contributions of non-profit organisations required for SC development project?
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5. What are the suggestions to enhance the engagement of non-profit organisations for the success of SCPs?
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Contributions of opposition political parties

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Opposition political parties	Sharing their experiences		
	Commenting on the governance		
	Commenting on the project activities		

1. What are the existing influences/ contributions of opposition political parties over the project?
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2. Is the current contribution effective? Yes/ No
Please provide reasons.

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3. What are the issues faced due to ineffective contribution of opposition political parties?

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4. What are the other potential contributions of opposition political parties required for SC development project?

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5. What are the suggestions to enhance the engagement of financial opposition political parties?

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Thank you for your contribution

Appendix 'C': Questionnaire for model validation

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………………………..,

Dear Sir/ Madam,

Questionnaire for Dissertation – M.Sc. by Research Degree

I am a postgraduate student of University of Moratuwa reading for Masters of Science (by Research). In fulfilment of this degree, the students are required to study as a full-time research and produce a report on their study. The focus of my research is to ***develop a model to enable the engagement of stakeholders in SCPs***. The research is carried out under the supervision of xxxxxxxxxxxxxxx and xxxxxxxxxxxxxxxxxxxx.

This questionnaire will be distributed to the professionals of SC development projects. The confidentiality of the organization as well as the participants will be maintained throughout the research and the identities of the participants will not be revealed in any document or event relating to this study. I hereby certify that the information collected from this interview will be used only for fulfilling the research aim. I would be grateful if you could participate in this interview.

Thank you,
Yours faithfully,
xxxxxxxxxxxxxxxxxxxxxx

SECTION A - BACKGROUND INFORMATION OF THE RESPONDENT

Name of the respondent (optional): …………………………………………………

Designation: …………………………………………………………………………….

Organisation (optional): ………………………………………………………………...

Experience in the field:………………………………………………………………….

SECTION B – VALIDATION OF THE FRAMEWORK

Please follow the following instructions when filling question 1.

Scale	Definition	Description
1	Poor	Highly below the expected level. Significant improvement needed.
2	Unsatisfactory	Below the expected level.
3	Moderate	Meets the expected level.
4	Satisfactory	Exceeds the expected level.
5	Outstanding	Highly exceeds the expected level.

1. Please mark ''X' on the rating column according to the rating scale given above by referring to the framework developed.

Criteria	1	2	3	4	5
Content					
Clarity					
Understanding					
Appropriateness					
Applicability					

2. Please mention on the improvements that needs to be fulfilled in the developed framework for ensuring effective stakeholder engagement for SCPs.

…………………………………………………………………………………

…………………………………………………………………………………

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Thank you for your contribution

Annexure 'D': Interview Transcript

SECTION A- BACKGROUND INFORMATION OF THE INTERVIEWEE

Name of the respondent (optional):

Designation: *Project Deputy Director*

Organisation (optional):

Experience in the field: *23 years*

SECTION B- ENGAGEMENT OF STAKEHOLDERS

c. What is the current status of smart city development projects in Sri Lanka?
Still at the initial stage. Rapid urbanisation in city areas will accelerate the implementation of the smart initiatives in Sri Lanka Is there any procedure followed in managing the stakeholders.

d. Is there any procedure followed in managing the stakeholders?
No standardised procedure is followed

e. Currently, what is the procedure followed in engaging stakeholder towards the success of the project?
According to the compliance with the rules and regulations

SECTION C- CONTRIBUTIONS OF THE STAKEHOLDERS

Contributions of the government

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Government	Initiating project and implementation	X	
	Providing required infrastructure and welfare services	X	
	Knowledge creation and capitalisation	X	
	Creating the required legal background	X	
	Improve the living standard and the quality of life citizens	X	
	Involve in policy making	X	
	Approving/ Rejecting approval	X	

1. What are the existing influences / contributions of the government over the project?
Development of control regulations other than the contributions in the table

2. Is the current contribution effective? Yes/ No
Please provide reasons.
Yes. Government is taking all the actions required

3. What are the issues faced due to ineffective contribution of the government?
As I think, the current contribution is sufficient

4. What are the other potential contributions of the government required for smart city development projects?
The current contributions are sufficient

5. What are the suggestions to enhance the engagement of government for the success of smart city projects?

Contributions of local and regional administrative bodies

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Local and regional administrative bodies	Initiating project and implementation	X	
	Identifying the requirement of the project	X	
	Promoting the project	X	
	Managing resources	X	
	Monitoring sustainability and security	X	
	Approving/ Rejecting approval	X	
	Representing the government	X	
	Funding	X	

1. What are the existing influences / contributions of local and regional administrative bodies over the project?

Further, Conducting EIA, IEE, checking the viability of the approvals are the other contributions in this project

2. Is the current contribution effective? Yes/ No
    Please provide reasons.

No, this is because, local administrative bodies cannot handle large capacity projects and require more technological advancements

3. What are the issues faced due to ineffective contribution of local and regional administrative bodies?

Project delays can occur because of this. Delays in infrastructure development will affect the project

4. What are the other potential contributions of local and regional administrative bodies required for smart city development projects?

Involvement in the policy development is required

5. What are the suggestions to enhance the engagement of local and regional administrative bodies for the success of smart city projects?

Regulation development and creating the legal background required and capacity development of the administrative bodies are required. Engagement of these bodies are important

Contributions of media

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Media	Reporting problems and the advantages of the project	X	
	Questioning on the development of the project	X	

1. What are the existing influences / contributions of media over the project?
   The stated contributions are only being carried out
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   No, should work without political influences and give the correct information to the society
3. What are the issues faced due to ineffective contribution of media?
   Protest can be occurred
4. What are the other potential contributions of media required for smart city development projects?
   The most important contribution required is transferring the correct information to the society
5. What are the suggestions to enhance the engagement of media for the success of smart city projects?
   Communication should be highly established

Contributions of financial suppliers/ investors

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Financial suppliers/ investors	Funding	X	
	Construction	X	
	Providing consultancy services	X	
	Initiating project and implementation	X	
	Carrying out feasibility study	X	
	Promoting the project	X	
	Providing loans	X	

| | Supplying labour | X | |
| | Planning | X | |

1. What are the existing influences / contributions of financial suppliers/ investors over the project?
   Other than these, public infrastructure development and they are getting into partnerships with the government
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   Yes, they are contributing for these development projects
3. What are the issues faced due to ineffective contribution of financial suppliers/ investors?
   -
4. What are the other potential contributions of financial suppliers/ investors required for smart city development project?
   The developers are being encouraged to identify the requirements of the development projects
5. What are the suggestions to enhance the engagement of financial suppliers/ investors for the success of smart city projects?
   Improving the facilities, policy changes, providing tax benefits and infrastructure development could ensure the engagement of them

Contributions of academia and research institutions

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Academia and research institutions	Initiating the project	X	
	Providing advices	X	
	Solving challenges	X	
	Guide in policy formulation	X	
	Involved in planning of the project	X	
	Innovation of new technologies	X	

6. What are the existing influences/ contributions of academia and research institutions over the project?
More to these, monitoring project activities can be identified as a contribution
7. Is the current contribution effective? Yes/ No
Please provide reasons.
Well it is better to have more research
8. What are the issues faced due to ineffective contribution of academia and research institutions?
Less attractiveness to these projects may occur
9. What are the other potential contributions of academia and research institutions required for smart city development project?
Need to conduct more research and publications
10. What are the suggestions to enhance the engagement of academia and research institutions for the success of smart city projects?
Necessary funds should be allocated the contributions of academia should be identified

Contributions of citizens

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Citizens	Engaging in decision making	X	
	Providing positive and negative views on the project	X	
	Providing the required physical assets	X	

1. What are the existing influences/ contributions of citizens over the project?
No interest in giving the positive comments on the project
2. Is the current contribution effective? Yes/ No
Please provide reasons.
No, they are not interested in finding the correct information regarding the project activities
3. What are the issues faced due to ineffective contribution of citizens?
Public protests are a huge challenge
4. What are the other potential contributions of citizens required for smart city development project?
They should develop the skills and involve in decision making
5. What are the suggestions to enhance the engagement of citizens for the success of smart city projects?

I agree on giving the required resources for the citizens. These projects are being carried for the betterment of the citizens. Ensuring the human rights also should be there.

Contributions of utility suppliers

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Energy suppliers	Providing Sustainable energy supply Funding	X	
	Promoting the project	X	
	Handling the project	X	
	Providing consultancy services	X	

1. What are the existing influences/ contributions of utility suppliers over the project?
   Above mentioned are there.
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   Yes, they are doing their maximum
3. What are the issues faced due to ineffective contribution of utility suppliers?
   Projects delays can occur. But here there is no such problem
4. What are the other potential contributions of utility suppliers required for smart city development project?
   Promoting sustainable utility supply should be carried out more in an interesting manner to the community
5. What are the suggestions to enhance the engagement of utility suppliers for the success of smart city projects?
   Required policies should be developed

Contributions of developers

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Developers	Contributing with knowledge and services	X	
	Utilising innovation and technological advancements	X	

	Exploit economic opportunities	X	
	Initiating project and implementation	X	
	Commenting on the project activities	X	

1. What are the existing influences/ contributions of developers over the project?
   The contribution identified are existing in the current context
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   Yes, accurate development is there
3. What are the issues faced due to ineffective contribution of developers?
   Of course project delays
4. What are the other potential contributions of developers required for smart city development project?
   They should promote new technology
5. What are the suggestions to enhance the engagement of developers for the success of smart city projects?
   Development of the policies required is important in here as well.

Contributions of non-profit organisations

Stakeholder	Contribution	Contribution identified in the project	
		Yes	No
Non-profit organisations	Commenting on the project activities	X	

1. What are the existing influences / contributions of non-profit organisations over the project?
   They comment on the project activities because of the political influence
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   No, they are being influenced by the political parties
3. What are the issues faced due to ineffective contribution of non-profit organisations?
   Protest are being influenced by these parties
4. What are the other potential contributions of non-profit organisations required for smart city development project?
   They should communicate with the public and transfer the correct information

5. What are the suggestions to enhance the engagement of non-profit organisations for the success of smart city projects?
   Workshops can be initiated as we are planning now

Contributions of opposition political parties

Stakeholder	Contribution	Contribution identified in the project	
		Yes	**No**
Opposition political parties	Sharing their experiences	X	
	Commenting on the governance	X	
	Commenting on the project activities	X	

1. What are the existing influences/ contributions of opposition political parties over the project?
   Above mentioned contributions are there
2. Is the current contribution effective? Yes/ No
   Please provide reasons.
   No, providing solutions only after problems arise in the project is not sufficient
3. What are the issues faced due to ineffective contribution of opposition political parties?
   Project delays are occurred
4. What are the other potential contributions of opposition political parties required for smart city development project?
   They should assist by sharing their experiences in similar projects

5. What are the suggestions to enhance the engagement of financial opposition political parties?
   Political stability is important and the required legal background should also be available

Thank you for your contribution