
A SPATIAL-BASED PROGRAMME APPROACH TO WATER SUPPLY DEVELOPMENT IN INDONESIA

A Thesis submitted to Newcastle University for the Degree of Doctor of Philosophy

DJUANG FADJAR SODIKIN

**SCHOOL OF ARCHITECTURE, PLANNING AND LANDSCAPE
FACULTY OF HUMANITIES AND SOCIAL SCIENCE
NEWCASTLE UNIVERSITY**

Abstract

Water provision is urgent in Indonesia. Currently, there are five water infrastructure systems programmed to improve the provision of water to users in Bandung City. These include a system for the south, two systems for the west, and two systems for the east of Metropolitan Bandung. Out of four phases, the first phase of the South System has been completed with four years of delay, while the following phases of the south, east, and west programmes are still being planned.

This research investigated the delay in completing the first phase of the South System, which was scheduled for completion in 2015 as one of the Millennium Development Goals. The research recognises that organisational structure (central, provincial, local (city/regency) governmental, and other stakeholders) and organisational processes both play a significant role in the programmes' completion.

Consequently, this research developed a mixed-analytical approach from the disciplines of spatial planning and programme management, emerging from their respective literature, to create the concept of a "Spatial-Based Programme Approach". This is a combined concept from both disciplines which draws on their respective concerns and strengths. It incorporates key aspects of spatial planning in integrating infrastructure components spatially, and key aspects of the programme approach in synergising related projects. Potentially, it may provide a new form of operation in the future development of water infrastructure programmes.

By using the abductive research process, I propose the Spatial-Based Programme Approach to address the synergy problems revealed by the research within the development of a regional water system in Indonesia. By considering the outcomes from an extensive literature review, intensive discussions with key informants in Bandung and Jakarta, and following this abductive research process, this research confirms that the Spatial-Based Programme Approach is a convincing management approach to the development of water supply in Indonesia.

Besides improving synergy, there may be certain other benefits for a programme in applying this approach, namely being more goal-oriented, adaptive and responsive to risks and changes, and promoting sustainable development. This research also recommends how to apply the Spatial-Based Programme Approach in the Indonesian context.

Key Words: Programme approach; spatial planning; water supply; Indonesia

Dedication

“From Newcastle. For Indonesia.”

Acknowledgements

First and foremost, I would like to express my sincere gratitude and deepest appreciation to my research supervisors, **Dr Susannah Gunn** and **Dr Peter Kellett**, for their persistent supervision, guidance, and encouragement.

I want to extend my appreciation to my Panel Member, **Prof Simin Davoudi** and **Dr Andrew Law**, for their valuable feedback during the Annual Progress Reviews. And I would also like to thank my Viva examiners, **Prof Mark Tewdwr-Jones** and **Dr Adrian Campbell**, for their constructing input and correction.

I would likewise like to thank the Ministry of Public Works and Housing for sponsoring my PhD research. My gratitude to the officials and staff in the Ministry and other colleagues in Indonesia Central Government, West Java Provincial Government, Bandung City Government, and Bandung City Water Company for supporting me with their data and information.

Last but not the least, I would like to extend my special gratitude and sincerest apology to my beloved wife **Umi Latifah Fauziah** and sons **Muhasibi Ahmad Fadjar** and **Musyaffa Ahmad Fadjar**, for being so patient to always support me in conducting the research and complete this PhD Thesis.

DJUANG FADJAR SODIKIN

Table of Content

Abstract	i
Dedication	ii
Acknowledgements	iii
Table of Content	iv
List of Tables	vi
List of Figures	vii
List of Abbreviations	ix
CHAPTER 1: INTRODUCTION TO THE RESEARCH BACKGROUND AND OBJECTIVES	1
1.1 Research Context	3
1.2 The Case Context	6
1.3 Statement of Problem	7
1.4 Research Question and Objectives	8
1.5 Substantial Scope of the Research	10
1.6 The Significance of the Research.....	11
1.7 Thesis Structure	12
CHAPTER 2: RESEARCH METHODOLOGY	15
2.1 Introduction	17
2.2 Positionality of the Research.....	17
2.3 The Methodological Approach.....	19
2.4 Research Process.....	23
2.5 Methods of Analysis	43
2.6 Standard of this Research.....	47
CHAPTER 3: ORGANISATIONAL PROCESSES AND STRUCTURES OF PHYSICAL INFRASTRUCTURE DEVELOPMENT	53
3.1 Introduction	55
3.2 The Organisational Processes and Structure	55
3.3 Basic Framework of the Organisational Processes	62
3.4 Amalgamated Framework of Organisational Processes	86
3.5 Organisational Structures of a Programme	90
3.6 Conclusion	106
CHAPTER 4: ANALYSIS OF INDONESIA’S NATIONAL GOVERNANCE AND GOVERNMENT SYSTEM	109
4.1 Introduction	111
4.2 National Governance System.....	111
4.3 Dual Planning System.....	121
4.4 Budgeting System	129

4.5 Monitoring and Evaluation System	134
4.6 National Issues, Policies, and Strategies for Water Supply Development.....	138
4.7 Organisations Involved in the Water Supply Sector.....	146
4.8 Conclusion	151
CHAPTER 5: ANALYSIS OF THE REGIONAL WATER SUPPLY DEVELOPMENT FOR BANDUNG CITY	155
5.1 Introduction	157
5.2 Geographical Scope of the Regional Water Supply.....	157
5.3 Regional Water Supply System in Metropolitan Bandung	161
5.4 Programme Preparation.....	165
5.5 Programme Implementation	183
5.6 Analysis of Organisational Structure	191
5.7 Conclusion	193
CHAPTER 6: EXAMINATION OF THE PROPOSITION	195
6.1 Introduction	197
6.2 Analysis of the Challenges and Advantages	197
6.3 The Complexity of the Water Supply Programme.....	201
6.4 Identification of the Requirements for the Water Supply Programme in Indonesia	208
6.5 Examination of the Spatial-Based Programme Approach.....	214
CHAPTER 7: APPLICATION OF THE SPATIAL-BASED PROGRAMME APPROACH...	227
7.1 Introduction	229
7.2 Expected Benefits from the Application of SBPA.....	229
7.3 Critical Points in Applying SBPA	235
7.4 Applying the Spatial-Based Programme Approach.....	249
7.5 Conclusion	263
CHAPTER 8: CONCLUDING THOUGHTS AND THE WAY FORWARD	265
8.1 Introduction	267
8.2 Lessons Learnt	267
8.3 Reflection on the Research Question.....	273
8.4 Lessons Learnt for Future Programmes.....	278
8.5 Empirical Contributions from this Research.....	279
8.6 Recommendation for Further Research	282
8.7 Personal Reflection: A Closing Remarks.....	282
APPENDIX I: DEFINITION OF KEY TERMS.....	285
APPENDIX II: GUIDING QUESTIONS FOR THE GROUP DISCUSSIONS AND INTERVIEWS.....	293
REFERENCES	299

List of Tables

Chapter 1

Table 1.1 National Water Coverage 2015 and 2019 Target (% of Household)	3
---	---

Chapter 2

Table 2.1 Research Activities during the First Fieldwork in Indonesia	29
Table 2.2 Attendees of the Group Discussion in Jakarta	34
Table 2.3 Attendees of the Group Discussion in Bandung	35
Table 2.4 Individual Interviewees during the First Fieldwork	35
Table 2.5 Unplanned Individual Interviews during the First Fieldwork	36
Table 2.6 Research Activities during the Second Fieldwork in Indonesia	38
Table 2.7 Recap of the Interviewees in the Second Fieldwork	39
Table 2.8 Primary Secondary Data from the Second Fieldwork	40

Chapter 3

Table 3.1 Organisational Processes Framework	56
Table 3.2 Formal and Informal Configuration of Organisational Structure	60
Table 3.3 Timeline of Planning, Programming, Budgeting, and Execution in the United States Department of Defence	80

Chapter 4

Table 4.1 Roles of Organisations Involved in the Water Supply Sector	146
--	-----

Chapter 5

Table 5.1 Timeline of Construction Works of the South System	186
Table 5.2 Organisational Settings and Involvement in the Programme	192

Chapter 6

Table 6.1 Challenges and Advantages of Water Supply Development in Metropolitan Bandung	198
---	-----

Chapter 7

Table 7.1 Taxonomy of Needs	236
Table 7.2 Type of Control at Programme Level	248
Table 7.3 Evaluating Programme Delivery	249
Table 7.4 Five Phases of Change Acceptance Process	251

Chapter 8

Table 8.1 Attainment of the Research Objectives	274
Table 8.2 Summary of the Lessons Learnt for Future Programmes	278

List of Figures

Chapter 1

Figure 1.1 Generic Scheme of the Segregation of Authorities in Constructing Water Supply Infrastructure in Indonesia.....	4
---	---

Chapter 2

Figure 2.1 Abductive Research Process	23
Figure 2.2 Research Milestones Utilising Abductive Approach.....	24
Figure 2.3 Diagram of SWOT Analysis	46

Chapter 3

Figure 3.1 Basic Model of Policy – Plan/Programme – Implementation Process.....	63
Figure 3.2 Classical PPIP Model.....	64
Figure 3.3 Invisible Hand of PPIP Model.....	65
Figure 3.4 Direct Planning of PPIP Model	65
Figure 3.5 Non-Decision of the PPIP Model.....	65
Figure 3.6 Policy Abort of the PPIP Model	66
Figure 3.7 Policy-Plan Abort of the PPIP Model	66
Figure 3.8 Direct Plan Abort of the PPIP Model	67
Figure 3.9 Direct Policy of the PPIP Model	67
Figure 3.10 Relationship between Strategy and Projects and Programmes	68
Figure 3.11 Model of Organisational Performance Production	72
Figure 3.12 Organisational Processes of Physical Infrastructure Development.....	88
Figure 3.13 Loose Programme Model.....	92
Figure 3.14 Strong Programme Model	92
Figure 3.15 Strong Programme Model	93
Figure 3.16 Framework of Relations between Spatial Elements	94
Figure 3.17 Relations of Five Terms of Working Together	95
Figure 3.18 Typology of Interdependence.....	98
Figure 3.19 Importance – Urgency Matrix	103

Chapter 4

Figure 4.1 Organisational Structure of the Political System in Indonesia.....	113
Figure 4.2 Hierarchy of Government in Indonesia	118
Figure 4.3 Divisions of Government Functions.....	119
Figure 4.4 Indonesia’s National Development Planning System	122
Figure 4.5 Milestones for Annual Development Planning	124
Figure 4.6 Spatial Planning System in Indonesia	126

Figure 4.7 Relations between Development Planning and Budgeting Systems	130
Figure 4.8 Annual Budgeting Milestones	131
Chapter 5	
Figure 5.1 Map of Metropolitan Bandung	158
Figure 5.2 Divisions of Districts in Bandung City	159
Figure 5.3 Service Coverage of Bandung City Water Company	160
Figure 5.4 Illustration of the South System of Regional Water Supply	164
Figure 5.5 Functional Components of a Modern Day Water Utility	183
Figure 5.6 Projects Implemented in the Regional Water Supply System	184
Chapter 6	
Figure 6.1 Flow Chart for Deciding on a Project or Programme	212
Chapter 7	
Figure 7.1 Influence of Plans on Development.....	239
Figure 7.2 Change Acceptance Process	250
Figure 7.3 Team, Group, and Collection of Individuals	257

List of Abbreviations

Bappenas	: <i>Badan Perencanaan Pembangunan Nasional</i> [National Planning Board]
BCG	: Bandung City Government
BPKP	: <i>Badan Pengawasan Keuangan dan Pembangunan</i> [The Board of Finance and Development Surveillance]
DAK	: <i>Dana Alokasi Khusus</i> [Special Allocation Fund]
DDUB	: <i>Dana Daerah untuk Urusan Bersama</i> [Funds for Joint Affairs]
DED	: Detailed Engineering Design
DPD	: <i>Dewan Perwakilan Daerah</i> [Regional Representatives Council]
DPR	: <i>Dewan Perwakilan Rakyat</i> [House of Representatives]
DPR	: <i>Dewan Perwakilan Rakyat Daerah</i> [Provincial/Local House of Representatives]
Gol	: Government of Indonesia
KPBU	: <i>Kerjasama Pemerintah dan Badan Usaha</i> [Government to Business Cooperation]
MDGs	: Millennium Development Goals
MK	: <i>Mahkamah Konstitusi</i> [Constitutional Court]
MoAASM	: Ministry of Agrarian Affairs and Spatial Management [<i>Kementerian Agraria dan Tata Ruang</i>]
MoPW	: Ministry of Public Works and Housing [<i>Kementerian Pekerjaan Umum dan Perumahan Rakyat</i>]
MoU	: Memorandum of Understanding
MPR	: <i>Majelis Permusyawaratan Rakyat</i> [People's Consultative Assembly]
Musrenbang	: <i>Musyawah Perencanaan Pembangunan</i> [Planning Development Meeting]
NMTDP	: National Medium-Term Development Plan
OECD	: Organisation for Economic Co-operation and Development
PDAM	: <i>Perusahaan Daerah Air Minum</i> [Local Water Supply Company]
PMO	: Programme Management Office
PO	: Programme Office
PPBE	: Planning, Programming, Budgeting, and Execution
PPBS	: Planning, Programming, and Budgeting System
PPIP	: Policy-Planning-Implementation Process
RISPAM	: <i>Rencana Induk Sistem Penyediaan Air Minum</i> [Water Supply Master Plan]
RKP	: <i>Rencana Kerja Pemerintah</i> [Government Work Plan]
RPJMN	: <i>Rencana Pembangunan Jangka Menengah Nasional</i> [National Mid-term Development Plan]
RPJPN	: <i>Rencana Pembangunan Jangka Panjang Nasional</i> [National Long-term Development Plan]
RTPI	: Royal Town Planning Institute
Rol	: Republic of Indonesia
SBPA	: Spatial-Based Programme Approach
SWOT	: Strength-Weaknesses-Opportunities-Threats
UNDP	: United Nation of Development Programme
WJPG	: West Java Provincial Government

This page is intentionally left blank

CHAPTER 1
INTRODUCTION TO THE RESEARCH
BACKGROUND AND OBJECTIVES

CHAPTER 1 INTRODUCTION TO THE RESEARCH BACKGROUND AND OBJECTIVES

1.1 Research Context	3
1.2 The Case Context	6
1.3 Statement of Problem	7
1.4 Research Question and Objectives	8
1.4.1 Research Question.....	8
1.4.2 Research Objectives	9
1.5 Substantial Scope of the Research	10
1.6 The Significance of the Research.....	11
1.7 Thesis Structure.....	12

1.1 Research Context

McCawley (2015) claims that the management of water remains one of the most pressing issues in infrastructure policy in Indonesia. According to the Directorate of Water Supply¹ (2016), water supply provisions, as one of the basic services, do not cover the entire population. In 2015, only 71% of total households had access to safe potable water (piped and non-piped distribution), and the other 29% (± 70 million of the population) had minimal access (Directorate of Water Supply, 2016: 3-4).

An ambitious target was set up in the National Medium-Term Development Planning (NMTDP) 2015-2019 to achieve 100% safe water coverage by 2019 (Gol, 2015c). The government has targeted an increase in the proportion of households with access to piped water from 17% in 2015 to 60% in 2019. Other access to water (40%) relies on non-piped distribution, such as bottled water.

Table 1.1 National Water Coverage 2015 and 2019 Target (% of Household)

	2015	2019
1. Safe Access (a +b)	71.05	100
a. Piped	17.10	60.00
b. Non-piped	53.95	40.00
2. Unsafe Access	28.95	0
Total	100	100

Source: adapted from Directorate of Water Supply (2016)

These efforts to accelerate water provision face certain challenges. One issue is the decentralised system in Indonesia implemented in 2001. Campbell and Coulson (2006) argue that a decentralised system should lead to a more efficient public service provision. However, the decentralised system in Indonesia demands more complex coordination and the synchronisation of more organisations, leading to greater challenges in accelerating service provision.

In the water supply sector, the decentralised system has transferred responsibility for the development of domestic water supply to the local government level (City/Regency), which has autonomy over the construction of the whole water infrastructure system. However, should the local government be unable to provide the minimum required water services, the central and provincial government can provide limited assistance with raw/untreated water intake, and the construction of water treatment plants, production units, and main pipeline distribution (see Figure 1.1).

¹ under the Indonesian Ministry of Public Works and Housing

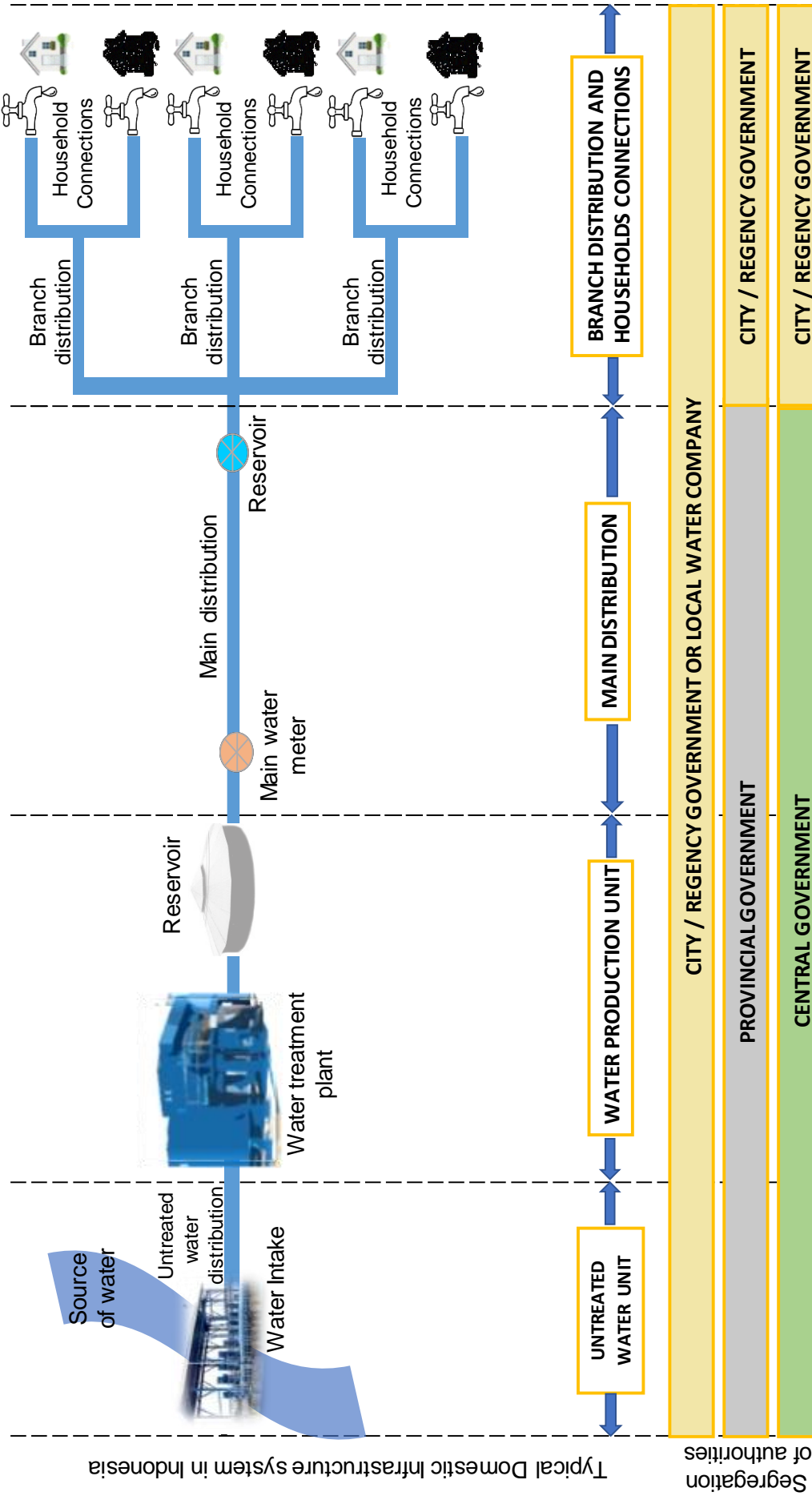


Figure 1.1 Generic Scheme of the Segregation of Authorities in Constructing Water Supply Infrastructure in Indonesia

Source: adapted from Directorate of Water Supply Development (2016: 13)

Under certain conditions, the central and provincial governments have restrictions on participating in the infrastructure programme. Firstly, when the infrastructure system involves two or more provinces, only the central government can take responsibility and not one of the provinces. Secondly, when the infrastructure system involves two or more cities/regency within one province, the central government can only construct untreated water unit and water production unit, with the main distribution installed by provincial government.

Consequently, the method of developing water infrastructure in Indonesia has changed from managing one large project during the centralised system to several smaller projects in the current decentralised system. Hence, it has led to the challenge of integrating all the related projects efficiently towards effectively achieving intended outcomes. These challenges in synergising projects exist at both the implementation, i.e. construction phase, and during programme preparation, such as when formulating spatial and development planning, programming, and budgeting processes.

With limited financial resources from the local government, it is likely that the local government and the Water Company must work together in synergy with the provincial and central governments to construct the whole water infrastructure system (Antono, 2018). Pressman and Wildavsky (1973), in their seminal book entitled *Implementation*, theorise that this type of organisational complexity, emerging from the need for joint action between institutions, is likely to inhibit the smooth implementation of policies.

The challenge in synergising organisational processes and structures in water supply sector also occurs in the regional water supply development in Metropolitan Bandung, as the case study location of this research. The central, provincial, city/regency, and two local water companies were involved in conducting the programme and projects with their respective responsibilities.

This research seeks to contribute to finding an effective approach to synergising the related institutions involved in conducting such prolonged processes of infrastructure development. The issue of the programme delivery of infrastructure is one focus of the Indonesia Ministry Public Works and Housing, as the sponsor of this research. This topic is also a personal interest that emerged from my educational background in Planning and Development Studies, complemented by my experience of working for more than a decade in the field of programming and budgeting in the Ministry of Public Works and Housing.

1.2 The Case Context

Because of its complexity and the urgency of the situation, Bandung City on Java Island, the capital city of West Java Province, was selected as the case study area of this research. With more than 2.4 million inhabitants in 2015 (Central Bureau of Statistics, 2018: 42), Bandung City is the fourth most populated city in Indonesia and with its surrounding area forms Metropolitan Bandung as the second highest populated urbanised area after Metropolitan Jakarta.

The main reason for choosing Bandung City lies in its major problems with domestic water supply. The coverage of safe potable water through the city pipeline system in 2015 is only 73% (BPPSPAM, 2018: 37), and is below the national average of 83% for urban areas (Directorate of Water Supply, 2016: 3). Accordingly, 29% of the total population in 2015, or around 700,000 people, have no access through the pipeline-based water supply.

Moreover, the quantity and quality of the current water supply through the pipeline network is unreliable. It occurs even for those who have it, as water pressure is frequently unstable, the water can be unclear, and it may be less safe to drink, especially during peak demand in the morning and afternoon.

According to the Medium-Term Development Plan of Bandung City 2013-2018, one of the main problems in improving water supply service in Bandung City is the lack of water resources within the city (BCG, 2014). Therefore, Bandung City should take water from neighbouring areas such as Bandung Regency and West Bandung Regency. Consequently, regional cooperation with other local governments that have more water resources is inevitable.

Indeed, this situation is normal where a city dominated by the built environment requires support to fulfil its need for natural resources, such as water supply, from another area. Nevertheless, Indonesia has its unique challenges in promoting cooperation of two or more local or provincial governments, especially since the decentralised system has been implemented. The current government system has led the local governments, with their regional autonomy, to tend to be inward-looking, which creates difficulties in building coordination regionally (Firman, 2009).

In the case of regional water supply in Metropolitan Bandung, it involves Bandung City, Bandung Regency, and other surrounding local governments under the coordination of West Java. Five systems were planned to provide additional water for Bandung City, namely the South System, West Systems 1 and 2, and East Systems 1 and 2. Since the West and East Systems remain future programmes, this research focuses on the South System.

More specifically, this research focuses on the development of the first of four phases of the South System. According to an official from Water Supply Division in West Java Provincial Government, the development of the first phase was initiated in 2009 as one of the water supply programmes which would support the achievement of the Millennium Development Goals (MDGs) by 2015. Unfortunately, due to internal and external factors, the whole water supply infrastructure of the South System was only completed in early 2019.

1.3 Statement of Problem

McCawley (2015: 263) describes infrastructure development in Indonesia as “a bewildering kaleidoscope of promises, under-fulfilment, delays, and outright cancellations”. Furthermore, he also suggests that the development of infrastructure is conducted with little coordination between central, provincial, and local governments and economic principles are often brushed aside in the design of infrastructure policy.

These problems also occur in the water supply sector, as the focus of this research, including the development of the water supply in Metropolitan Bandung. By comparing the MDGs target for 2015 with the completion of the construction work in 2019, there was thus a four-year delay in completing the first phase of the regional water supply infrastructure.

Various reasons were behind the prolonged delay in completing the whole water supply infrastructure system in Bandung, such as the time lag between one project to another and the delay in finishing a particular project. This situation shows the lack of efficiency in synergising the resources of related projects within a programme. Accordingly, this research focuses on addressing delays and synergy issues, with specific attention to the organisational processes of the programme and its organisational structure.

Although delays happen everywhere, the case of regional water infrastructure development in Indonesia offers presents distinct characteristics. Moreover, this research not only looks at the problems and possible solutions within the narrow scope of the programme, but also addresses the broader system at the national level, which might hinder the acceleration of the development of water supply infrastructure in Indonesia.

1.4 Research Question and Objectives

The following discussions are on the research question and the research objectives that need to be accomplished to answer the research question. The discussion is coupled with the explanation of the related activities to achieve the objectives.

1.4.1 Research Question

In response to the problems of synergy in delivering the water supply programme that led to a prolonged delay, this research focuses on seeking possible solutions from the perspective of organisational processes and structure. Accordingly, the main research question is:

What measures are required to synergise organisational processes and structures for the development of water supply in Indonesia?

Organisational process refers to sequences of tasks and activities (Garvin, 1998). Furthermore, he groups organisational processes into three categories, which were adapted and made the focus of this research: works processes, with its focus on accomplishing tasks by looking at the input-output relationship between organisations involved; behavioural processes, which focus on looking at the ways of acting and interacting with organisations; and, change processes, which focus on how individuals, groups, and organisations adapt, develop, and grow during a sequence of events over time.

Organisational structure is usually understood to imply an enduring configuration of tasks and activities, including formal and informal dimensions (Skivington and Daft, 1991). Furthermore, they explain the formal configuration as the framework of an organisation with its roles and procedures. This includes rules, prescriptions of authority, and the hierarchy of authority. The informal dimension of organisational structure is the patterns of interaction between the organisations involved.

Synergising organisational processes and structures, in this research, means arranging organisations involved in an efficient link and interaction based on their respective roles towards effectively achieving intended goals. In line with this concern, Liedtka (1998) underlines how one of the aims of synergy is to seek to leverage capabilities at the level of the personnel and organisation to create new capabilities at a higher level.

Accordingly, it can be said that synergy is more than just combining into one, but also to create improved capabilities. For instance, in the water supply sector, it is not enough to see that an infrastructure system has been physically integrated; it must also be ensured that the system perform efficiently, e.g. without prolonged delay, and the functioning system finally produces safe potable water as its outcome.

By looking at the complexity of water supply development in Metropolitan Bandung and Indonesia in general, this research utilised abductive approach to seek the answer to the research question. According to Josephson (1996), the abductive approach or abduction method can provide a convincing explanation to a complex situation. Aliseda (2006) argues that it can be achieved by taking full advantage of the method in helping to explain a puzzling observation. Details of the abduction method are discussed thoroughly in the methodology chapter, Section 2.3.3.

1.4.2 Research Objectives

In order to answer the research question, several research objectives were set up as follows:

1. To gain insight into organisational processes and structures for physical infrastructure development

Physical development was chosen because water supply infrastructure development falls into this category. Drawing from academic and practice literature, the primary output from this chapter is a consolidated framework showing the whole organisational processes of physical infrastructure development, from needs assessment to the achievement of its outcomes. The amalgamated framework is coupled with discussions on the organisational structure of a programme. These outputs are utilised to guide the analysis and reflected during the formulation of recommendations.

2. Identify challenges facing the current water supply development system in Metropolitan Bandung

The analysis carried out to achieve this objective is guided by the amalgamated framework from the literature review, based on the information gathered from intensive discussions with key informants, and secondary data from related institutions in Bandung and Jakarta. The amalgamated framework is needed to ensure that the analysis covers all of the organisational processes of the water supply development in Metropolitan Bandung.

Insight from the literature review on the organisational structure of a programme is applied to analyse the current Indonesian national development system, and to assess in-depth the institutions involved in the development of regional water supply.

3. Formulate a proposition to address the problems of water supply development in Indonesia

Based on the first two objectives, a proposition is formulated to address the synergy problems in water supply development in Indonesia. It was conducted particularly by looking at lessons from the regional water supply development in Metropolitan Bandung. The proposed approach is then compared with other alternatives approaches, and confirmed with key informant interviews, to ascertain the most convincing proposition.

In order to make the proposition applicable to the current government system in Indonesia, a recommendation on how to apply them is also formulated. This concerns how to organise the prolonged development processes and prepare an organisational structure in managing the development of water supply in Indonesia efficiently and effectively.

1.5 Substantial Scope of the Research

This research covers the organisational processes and structures in conducting a programme from the first initiation to the achievement of outcomes. It seeks evidence of how the water supply programme is planned, the process of its delivery, and how well this mirrors what was planned to reflect on what was accomplished. These will be seen from both theoretical and practical perspectives towards the synergised development of water supply infrastructure in Indonesia.

The discussion focuses not only on the case study of regional water supply infrastructure in Metropolitan Bandung but also the external factors that might impact the preparation and execution of the programme, such as the policies and regulations at the national and provincial level. These external factors will be considered in the light of whether they supported or hindered the synergy of the development of water infrastructure in Indonesia.

Researching the organisational processes means that this research looks at the whole process, from its first initiation until the achievement of outcomes, and its connections within the frame of the programme. Each process and project are analysed, in terms of their plan and target, against its implementation, what was hindering the process or what made them successful, and what might be learned from them.

Nevertheless, researching the processes alone is insufficient without looking at the institutions involved as the actors running each step within them. Accordingly, the organisations are also analysed, including how they relate and interact with other organisations and within the organisation. This includes an in-depth consideration on the personal level, and how this may have significantly influenced the process.

This research focuses more on the organisational processes and structures of the government, from central to local government. This is because the most significant investment (70%) for water supply development nationally are from the government budget allocation (Directorate of Water Supply, 2016). Moreover, the development of regional water supply infrastructure in Metropolitan Bandung, as the case study, is fully funded by the government investment.

1.6 The Significance of the Research

The nature of this research can be categorised as applied research since the solution to the problem addressed will have a practical impact (see Booth *et al.*, 2008). Therefore, as seen from the objectives, and in accordance with Forester (2015), this type of research should give equal attention to both theoretical and practical life. In addition to this idea, Kor and Wijnen (2007: 4) state that concepts can only prove their value if they are used in practical situations.

In the context of current knowledge, this research enriches the discussion in planning studies by offering a systematic method of linking planning to the achievement of intended outcomes. This research not only offers beneficial new ideas at conceptual level, but also can contribute to practical ways to link planning to outcomes. This is essential, mainly because some theorists have focused on process and others on outcomes (Christensen, 2015). This dislocation between a plan and an action, or outcome, as Parker and Doak (2012: 84) suggest, is a longstanding and serious issue.

In a practical context, the outcomes from this research can provide valuable contributions in formulating policies, strategies, and guidelines to improve the effectiveness, efficiency, and reliability of water supply infrastructure development in Indonesia. Another contribution of this research lies not only in its review of the literature, but also in the lessons which can be learnt from the case study analysis. Finally, the proposed concept of the Spatial-Based Programme Approach (SBPA), as a new analytical approach, should be able to improve the organisational processes and structures in preparing and implementing a water supply development programme in Indonesia in the future.

1.7 Thesis Structure

This thesis is structured in eight chapters, following the abductive approach as the framework through which to answer the research question and objectives systematically. After this first chapter, the structure is as follows:

Chapter 2: Research Methodology. This sets out the research methodology, covering discussion of the methodological approach, research process, methods of analysis, and the standard of this research. This chapter supplies a clear description of how this research has been conducted, its activities and the research tools used, and the rationale.

Chapter 3: Organisational processes and structures of Physical Infrastructure Development. This literature review chapter identifies and elaborates the basic framework by discussing organisational processes for physical infrastructure development. The identified frameworks are then amalgamated to establish the whole process of physical infrastructure development. The discussion is coupled with a description of the organisational structure of a programme, to give an overview of the complexity of a programme's organisational processes and structure.

Chapter 4: Analysis of Indonesia's National Governance and Government System. This chapter discusses the national system that has had an influence on the projects and programmes at the provincial and local level. It starts by discussing the current decentralised system, the implications of the political system, and the government system. In more detail, this chapter also discusses the national planning and budgeting system, coupled with the system at the regional and local level. All these discussions are related to the issues of the water industry. The chapter concludes by discussing national issues on water supply development in Indonesia.

Chapter 5: Analysis of Regional Water Supply Development for Bandung City. This chapter analyses the whole processes of regional water supply development in Metropolitan Bandung, particularly the first phase of the South System. Most of the analysis utilises the academic and practical literature reviewed in Chapter 3. The chapter also discusses in detail the processes and related issues on the needs assessment, planning process, programming, budgeting, project execution, monitoring and control, and evaluation.

Chapter 6: Examination of the Proposition. This chapter examines and confirms whether the proposition, SBPA, is compatible with the case of water supply development in Indonesia. Accordingly, before examining the SBPA, the discussion starts with analysis of complexity of the water supply programme and analysis of the strengths, weaknesses, opportunities, and threats of the regional water supply development programme, and is followed by discussing the needs in managing such a programme. The examination of the approach was also done by comparing it with other alternatives management concepts.

Chapter 7: Application of the Spatial-Based Programme Approach. The discussions in this chapter identify expected benefits from the SBPA when it is appropriately applied in each development process. There is also a recommendation on how to apply the SBPA to conduct all the whole processes and set up a related organisational structure in the form of a programme office.

Chapter 8: Concluding Thoughts and the Way Forward. This chapter brings together the discussions from seven previous chapters to arrive at the conclusion in answering the research question, show the significance of this research, and recommend potential further research.

This page is intentionally left blank

CHAPTER 2

RESEARCH METHODOLOGY

CHAPTER 2 RESEARCH METHODOLOGY

2.1	Introduction	17
2.2	Positionality of the Researcher	17
2.3	The Methodological Approach	19
2.3.1	Qualitative Research	19
2.3.2	Critical Realism as the Guiding Theory	20
2.3.3	The Abductive Approach	21
2.4	Research Process	23
2.4.1	Research Milestones	23
2.4.2	Prior Knowledge	25
2.4.3	Literature Review	26
2.4.4	First Fieldwork: Scoping Study	27
	<i>Purpose of the Fieldwork</i>	27
	<i>Group Discussions</i>	29
	<i>Individual Interviews in the First Fieldwork</i>	32
	<i>List of Interviewees</i>	33
	<i>Instruments for Data Collection</i>	36
2.4.5	The Second Fieldwork: In-depth Study	37
	<i>Fieldwork Timeline</i>	37
	<i>Individual Interviews in the Second Fieldwork</i>	38
	<i>Secondary Data Collection</i>	40
	<i>Confirmation of the Interim Findings</i>	41
2.4.6	Examining the Preposition	41
2.4.7	Application of the Concept	42
2.5	Methods of Analysis	43
2.5.1	Data Preparation	43
2.5.2	Exploratory Analysis	44
2.5.3	SWOT Analysis	45
2.5.4	Explanatory Analysis	46
2.6	Standard of this Research	47
2.6.1	Scientific Inquiry	47
2.6.2	Reliability and Validity	48
2.6.3	Ethical Issues	51

2.1 Introduction

Schensul (2008: 516) suggests that the research methodology section should include the research blueprint or roadmap that the researchers have employed and the justification for choosing research methods, to render their work open to analysis, critique, replication, repetition, and adaptation. Therefore, this methodology chapter is focused on describing the methodological approach, the design of the research processes, and the research activities in the field, complemented by its justifications. The first point of discussion regards the positionality of the current researcher, in order to describe the advantages of, and challenges in, doing the research.

2.2 Positionality of the Researcher

This research is sponsored by Indonesian Ministry of Public Works and Housing as the institution at the national level dealing with domestic water supply. As a senior staff member of the ministry who has worked in the Division of Programming and Budgeting since 2005, I became an embedded researcher. This meant there were certain advantages and challenges in conducting the research.

Significant advantages from my positionality as an embedded researcher are in accessing data, a closer connection to key informants, and keeping updated with the progress of the water supply development in Metropolitan Bandung as the case study. These advantages were employed not only during the research in the field but also from the very start of the research when choosing the topic, to designing the fieldwork, and later during the stage of writing this thesis.

Being an insider helped me to gain easier access to various data and information than an outsider researcher, for example, to access contract documents between the ministry and the contractors for all construction projects supporting the development of regional water supply infrastructure. These data assisted me in the creation of a timeline for the projects starting from 2012 to 2018, as discussed in Section 5.5.2.

Having closer relations with most of the key informants was also helpful from the very beginning of this research, starting with deciding water supply infrastructure as the selected case study. Earlier, there were options to choose between domestic water supply and road development, both of which share a similar complexity due to the division of authority. By comparing its urgency, the choice fell into the water supply sector.

One of my superiors suggested that I take the water supply sector since it has a more complex character than road development in terms of producing their outputs and outcomes. This is because a constructed road can be utilised even when it is only partially completed, but water infrastructure must be fully completed before the whole system functioning.

Another advantage to having a closer and personal relationship with key informants is the ability to dig for information “under the skin”. Informants tend to be more careful about sharing sensitive information with the public, especially if related to flaws and faults in conducting work. In this study, it was not problematic to dig for hidden information, and all names have been anonymised throughout this thesis.

Having direct contact with key informants is also beneficial for triangulating data and findings. One official in the Water Supply Division of the Ministry allocated his time and invited his staff to attend my presentation during my second fieldwork to confirm the initial findings from this research. Their feedback gave me confidence that this research is on track.

Maintaining relations with the key informants carried out through various means, such as text messages and following personal and company social media accounts. One benefit of this was keeping updated with the progress of the water supply development in Bandung City. For example, critical information was learned from the Directorate General of Human Settlement’s Twitter account, which shared the date of the celebration ceremony marking the full functioning of the South System on 10 January 2019.

Besides these advantages, there were also certain challenges which were not in the form of difficulties in conducting the research, but in ensuring that this research could be received as being perfectly able to withstand criticism. Therefore, self-criticisms are presented in this thesis in both the statements from key informants and my interpretation of the current problems around the case study. From this, it should be evident that this research is conducted objectively.

Also, the Ministry of Public Works and Housing, as my sponsor, never sent any message to me, or pressured me to hide anything, for example, flaws or other problems found during the research. Consequently, this research was developed and conducted academically based on the institution and personal interest in consideration of the urgency and importance of the research for the development of the water supply in Indonesia.

2.3 The Methodological Approach

This Section elaborates: the paradigm and approach in conducting this research, starting with the discussion on qualitative research as the focus; sets out this research's understanding of Critical Realism as the guiding philosophical theory and the justification for using it; and, discusses the abductive approach as operational guidance. These three methodological approaches are related and complement each other to enable this research to adopt a high quality and rigorous approach to the research.

2.3.1 *Qualitative Research*

Considering the need to answer the main research question on measures required to synergise organisational processes and structures for the development of the water supply in Indonesia, the preferable research form is qualitative research. The main reason is to take advantage of qualitative research to carry out an investigation, to explore complexities, to 'get under the skin' of the reality of a group or organisation, and to view the case from the inside out (Gillham, 2000: 11). The other reason for this is to conduct in-depth studies on the research topic in plain and everyday terms (see Yin, 2011), which is vital in bridging academic insight into practical actions. Nevertheless, this qualitative research is supported by quantitative data when needed for supporting statements.

It is essential for this research to be able to 'get under the skin' of the research objects, to disclose the causes of the problems hindering synergy for the development of water supply in Indonesia. Looking at the complexity of the issues around this sector, it is an advantage that this research is conducted by an embedded researcher, since many intensive discussions with the key informants from various levels of government staff needed to be undertaken, and this is less possible for an outsider researcher. Moreover, various unpublished data can be more easily gathered by an embedded researcher rather than an outsider.

From the illustrative variations of qualitative research provided by Yin (2011: 17), i.e. action research, case study, ethnography, phenomenological study, and the like, this research can be categorised as a case study research. Gillham (2000) defines the case study as an investigation of an individual, group, community, or institution to answer specific research questions and uncover a range of different kinds of evidence to obtain the most convincing possible answers.

This research investigates the case of the regional water supply infrastructure in Metropolitan Bandung in detail, at the individual and group/team levels, and in relation to their respective institution. At a broader level, the interaction between organisations is also a part of the analysis. All investigations were directed to achieve the research objectives and answer the research question, as described on Section 1.4.

2.3.2 Critical Realism as the Guiding Theory

Critical Realism espouses that ‘objects have properties that enable them to exercise certain forms of influences on other objects and make them liable to certain kinds of influences from other objects’ (Næss, 2015: 1231). The theoretical paradigm of critical realism is helpful as it is in line with the nature of this research, which investigates internal and external factors, and their connections, as they influence the development of the water supply in Indonesia as the research object.

Critical Realism has other features that fit this project as a case study research. Campbell (2012) explains that the concern of analytical scope with breaking down problems to produce facts or interpretations from a case is a feature of Critical Realism. This is supported by Easton (2010: 119), who says that Critical Realism ‘justifies the study of any situation, regardless of the numbers of research units involved’.

Further, the Critical Realism approach also accommodates multidisciplinary research with a more flexible way of analysing limited data. This research needed to employ such an approach as it combines multi-disciplinary tasks from planning, programming, budgeting, monitoring, and evaluation. This type of research is accommodated very well in Critical Realism, as Bhaskar and Danermark (in Næss, 2015: 1234) mention that ‘Critical Realism is a meta-theoretical platform accommodating and encouraging interdisciplinarity to a particularly great extent’.

The critical realist underlines that the world is more than just its observable events (Næss, 2015; Clark, 2008). Critical Realism appreciates that there are observable objects within the research scope, unobserved phenomena that are intentionally or accidentally uncovered by research, and certain other unobservable events beyond the research area. This theory challenged this research to identify as many events as possible that influence the development of the regional water supply infrastructure in Bandung. Moreover, Critical Realism encourages to focus on particular areas, but without overlooking other factors that can influence the existence of the research objects.

2.3.3 The Abductive Approach

A strong focus in research alongside Critical Realism is to understand causality and explain events within their actual domain (Clark, 2008). One aim of this research is to identify the challenges as the causes of delay in providing additional water supply services in Indonesia, followed by an analysis of how to find the correct solutions. Clark (2008) states that this movement from events to their causes is known as “abduction”.

It is necessary that a research process, as the summary of all the sequential steps a researcher engages in, follows the path of a specific research approach (Kovács and Spens, 2005). Induction, deduction, and abduction are forms of logical reasoning as a means of connecting and generating ideas and becoming the basis of any research (Reichertz, 2014). More specifically on abduction, the primary aim of this method is to develop an understanding of a “new” phenomenon, while induction traditionally aims to generalise findings from empirical data (Kovács and Spens, 2005).

Broadly, abduction is a reasoning process invoked to explain a puzzling observation, starting with thinking from evidence and then moving to explanation (Aliseda, 2006). Danermark *et al.* (2002) suggest that utilising abduction allows a phenomenon or event to be interpreted from a set of general ideas or concepts. Carson (2009) uses the analogy that the abduction approach is that of a detective conducting a criminal investigation which more based on the fact in the scene to a comprehensive report to seek the most convincing explanation.

For the purpose of a research, Josephson (1996) defines the abductive approach and method as moving from the inference, to the best explanation from the data, to a hypothesis or proposition that best explains or accounts for the data. For practical reason, I prefer to use the term “proposition” throughout this thesis to substitute the term “hypothesis”, since the term “proposition” here is also meant to answer the research question, but with no requirement to test them. Josephson (1996) discusses the term “proposition” extensively in his book to discuss the abductive approach.

Considering its complexity and using the terms introduced by Aliseda (2006), researching the development of water supply in Indonesia can be considered as “puzzling observation”. There are many overlapping processes with many organisations involved. Accordingly, armed with prior theoretical and practical knowledge, an in-depth literature review was conducted, followed by intensive discussions with key informants during two fieldwork periods, to seek the most convincing explanation and proposition to answer the research question.

Josephson (1996) explains that the abduction process includes the whole process of the generation, criticism, and possible acceptance of an explanatory hypothesis; in this research, this process was performed on the proposition to answer the research question. Accordingly, the general process of abduction can be explained as follows (adapted from Josephson, 1996: 5).

D (Data) is a collection of facts, observations, and givens.

P (Proposition) explains D (would, if true, explain D).

No other proposition can explain D as well as P does.

Therefore, P is probably true.

The judgment of the likelihood of an explanation and proposition, associated with the abductive conclusion, should depend on the following four considerations, as adapted from Josephson (1996: 14):

1. How decisively the proposition surpasses the alternatives;
2. How reasonable the proposition is by itself, independently of considering the alternatives (we should be cautious about accepting a proposition, even if it is clearly the best one, we have if it is not sufficiently plausible in itself);
3. Judgements on the reliability of the data;
4. How much confidence there is that all plausible explanations have been considered (how thorough was the search for alternative explanations).

Aliseda (2006) suggests that abduction should connect to both the construction and selection of an answer to the research question. Furthermore, he says that some authors consider these processes as two separate steps, construction dealing with what counts as a possible abductive explanation, and selection by applying some preference criterion over possible abductive explanations to select the most convincing one.

Accordingly, this research does the construction, examination, and selection of the most convincing proposition to address the problem researched. By conducting these research activities, the examination process of a proposition as the potential answer to the research question comes up with three possible outcomes: reject the proposition, accept it as it is, or accept it with changes. This examination and selection of the proposition from this research are elaborated in Section 6.5.

Constructing a view based on diverse literature, Kovács and Spens (2005) synthesised and illustrated the abductive research process as shown in Figure 2.1 below. The detail of this research activity mirrors the abductive research process as elaborated in the next Section (see Figure 2.2).

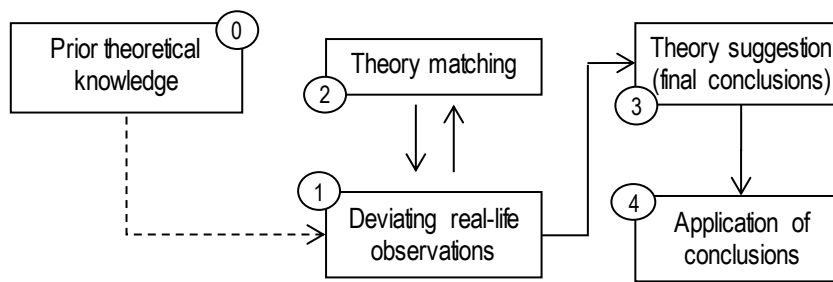


Figure 2.1 Abductive Research Process

Source: Kovács and Spens (2006:139)

The process starts with a real-life observation. Nevertheless, the abductive approach appreciates the role of prior theoretical knowledge (box 0), which has a significant influence on the observation. This influence is indicated by a dotted line from “box 0” to “box 1”. The next process is “theory matching” (box 2), which attempts to find a new matching framework to extend the theory used before the observation, or introduce a new theory, or a new framework, to already reviewed literature.

There is an iterative process between observation and theory matching. An observation can refocus the literature review on the theory matching process and, vice versa, the reshaped theory might influence how the real-life observation should be conducted. Also, Fletcher (2017: 188) mentions that abduction is also known as theoretical re-description, where empirical data are re-described using theoretical concepts.

After conducting a thorough observation, which is strengthened by the theory matching process, research following the abductive approach should produce a “theory suggestion” (box 3). This suggestion should be the conclusion to answer the research question. It is suggested that research utilising the abductive process is concluded with the application of the proposition (box 4).

2.4 Research Process

All activities for this research followed the abductive process as discussed above. The following Sections discuss the main research milestones and their relation to the structure of this thesis, followed by an elaboration of each research activity.

2.4.1 Research Milestones

The following discussion gives an overview of how this research was conducted. The research milestones in Figure 2.2 show the four main research stages, following the abductive research approach above (see Figure 2.1).

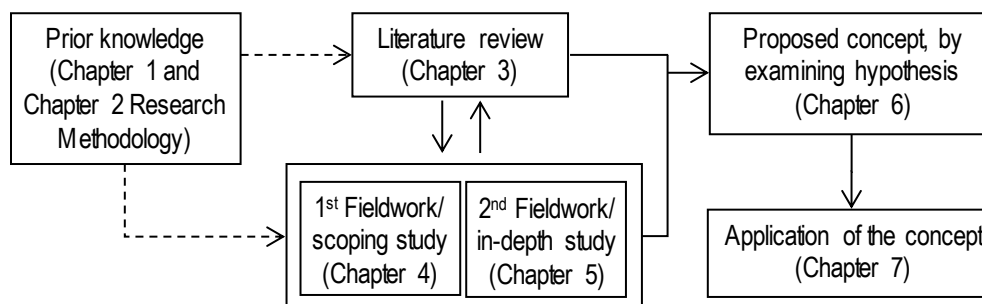


Figure 2.2 Research Milestones Utilising Abductive Approach

Some adjustments were made in response to the need to conduct this research, particularly for doing the fieldwork and formulating the proposed concept. These adjustments included: removing numbers indicating rigid sequential steps to allow for a more flexible research process; adding a line indicating straight input for the literature review; changing the iteration process between the literature review and the two fieldwork periods; and, adding a line showing that input for the proposed concept also came from the literature review.

As can be seen from the original abductive process in Figure 2.1, the input for theory matching is achieved merely by considering the input from the observation process. However, this research also appreciated prior theoretical knowledge obtained from the previous study and professional experiences of the researcher. The previous theoretical knowledge was a starting point in conducting a thorough search over wider yet more in-depth sources.

Another adjustment was made to the sequence of conducted research activities. For example, unlike the original abduction process, where observation should be done before theory matching, this research set the observation and literature review or theory matching in parallel. By setting up a new iterative process, the literature review and fieldwork complemented each other. For example, the first observation strengthened the problem addressed in this research around the issue of delay, which led to the search for literature discussing the same issue, which was found in the book of implementation by Pressman and Wildavsky (1973), and so on.

Depart from the literature review and fieldwork activities, the proposed concept of the Spatial-based Programme Approach (SBPA) was formulated. During the fieldwork, this proposed concept was also discussed with key informants. The discussions were about whether the SBPA would be applicable in the Indonesian situation and were also an examination and selection of the SBPA as the proposition arising from this research. Additionally, there were also discussions on how the approach might be implemented effectively.

A similar adjustment from the original abductive process was also applied for the input of the proposed concept. The original approach (see Figure 2.1) shows that the input from the proposed concept is only from observations, while in this research input was also received from the literature review. This indicates that the reviewed literature was utilised for the analysis in order to formulate a possible solution to address the problems focused on in this research.

As can be seen from Figure 2.2, each activity reflects a respective chapter of this thesis, albeit no strictly division of one research activity for certain chapter. For instance, the first fieldwork was conducted to gather information and write Chapter 4 of the analysis of the national system, but some parts of Chapter 5 are also discussed, and vice versa. Nevertheless, indicating that a chapter was produced from a respective research activity should emphasise that this research and the structure of this thesis consistently follow the abductive process, albeit with some adjustments.

2.4.2 *Prior Knowledge*

The abductive approach appreciates prior knowledge in conducting research. In this research, prior knowledge refers to knowledge gained from previous studies and the professional experience of the researcher in related fields. This prior knowledge influenced how the research was designed, clarify and analyse the collected data and information, and on the formulation of the proposition offered as the answer to the research question.

My educational background is in planning at undergraduate and master's level, with an additional master's degree in development studies. Knowledge from my formal educational background, coupled with more than eight years' experience as a programming and budgeting official at the Indonesian Ministry of Public Works and Housing, have helped me to select literature, formulate the research methodology, conduct the fieldwork, analyse findings, and formulate the proposition.

Furthermore, my educational background and professional experience have given many advantages in conducting this research. My professional network and personal relationships helped in approaching the key informants, including making them talk more freely. My professional network also enabled me to connect with informants with whom I had never had contact before the research.

These advantages helped the research run smoothly. Additionally, the Ministry of Public Works and Housing, as the sponsor, has also been very supportive of the research around the delivery of the infrastructure programme. Some officials in the ministry passed on extra literature and data for discussion in the thesis, and thus many relevant materials were provided for the research.

2.4.3 Literature Review

As discussed earlier, and represented in Figure 2.2, the literature review of this thesis is influenced by prior theoretical knowledge. Such reviews were undertaken not only during my undergraduate and postgraduate studies, but frequently also when actively working for the Ministry of Public Works and Housing. This prior knowledge helped in identifying and mapping the related literature.

Since the research was intended to be multidisciplinary, mapping the related literature is essential. As suggested by Mays *et al.* (2001), it is concerned with rapidly mapping the key concepts underpinning a research area and the primary sources and types of evidence available. The output from this stage was the list of literature as grouped based on the area of research, such as development processes, policy formulation, planning, programming, budgeting, and so on.

After the literature mapping, the literature review process was extended to a more in-depth search to improve understanding of the research subjects. From this, the key concepts from each area were extracted, to identify the knowledge gap as an opportunity to contribute new knowledge, as also suggested by Maier (2013). Thus, the literature review chapter in this thesis is intended not only to deepen the existing literature around the research area, but also to fill the knowledge gap.

The literature review was conducted both for the research topic and the methodology. As advised by Race (2008), researchers often neglect reviewing the method, methodology, and data literature that encompass different but essential parts of the qualitative research processes. Therefore, various research techniques were also studied, e.g. different types of interviews and research instruments.

Furthermore, the literature review influenced how the fieldwork was conducted, for two reasons. Firstly, the literature review on this substantial subject refocused the research scope, reshaped the research topic, restated the problems addressed, and refocused the research question and its proposition. Secondly, the literature review on research methodology and methods guided the planning of the fieldwork activities, including the selection of research techniques and tools.

The credibility of the literature sources was of concern in this research. For example, for online resources, as Fink (2014) emphasises, we need to be wary of the web as a source of credible research unless there is evidence that a site of interest is credible. Checks on the reputation of publishers and authors were also conducted to avoid using literature from unreliable sources.

This research prioritised literature that could be utilised as tools for analysis. Hence, there are close links between the literature review and analysis, as well with the formulation of the proposed concept for answering the research question. Many forms of analysis were utilised on the reviewed literature, which are elaborated more in Section 2.5 discussing the methods of analysis.

2.4.4 First Fieldwork: Scoping Study

Discussions in this Section start with the specific purpose of the first fieldwork, followed by assessing the group discussions and individual interviews conducted to gather information. This includes the recap of the interviewees from both group discussion and individual interviews. This Section is concluded with the information on the research instruments used during the first fieldwork.

Purpose of the Fieldwork

The focus of this first fieldwork was more as a scoping study. The aims of a scoping study include rapidly mapping the key concepts underpinning a research area, the primary sources, and types of evidence available (Arksey and O'Malley, 2005: 21), as well as contextualising knowledge by identifying what we know and do not know (Anderson *et al.*, 2008).

Since this research followed the abductive approach, the design of this first fieldwork was formulated using prior theoretical and practical knowledge and a further literature review. Besides gathering useful data and information, this first fieldwork was also conducted to open communication with the key informants regarding whether the formulated problems addressed in this research remain valid, and to reshape the research scope and focus.

Opening communication with prospective key informants is essential since there were several informants that I did not know personally. Thus, one target of the first fieldwork was to obtain the contact details (phone number and e-mail address) of all the key informants for further interviews and additional data. For participants who were already familiar because of previous professional relations, new communication concerning the research was already made before the fieldwork.

Recording the contact details of the key informants is vital should access to expected data during the fieldwork prove difficult, or if the required data were unavailable, among other problems. Contact details are also useful to remind the informants about promised data, clarify certain previous statements from a distance, and ask for new information.

Group discussions and individual interviews were conducted in this first fieldwork. The aim is to validate the prior knowledge, explain the research topic, and confirm the formulated problems to be addressed. A great deal of new knowledge was gained which helped refocus the research scope substantially and geographically. Additionally, there were interviews with academics as analytical partners, and these views from practitioners and academics complemented each other.

Since the aim of this first fieldwork was more to confirm the issues addressed in the research and open communication with the prospective key informants, it did not plan for extensive research activities. This fieldwork was conducted over an intensive eight days in Jakarta and Bandung from 5–12 December 2016.

It was assumed that it would take time to recall data from a few years back. However, some of the interviews came with detailed valuable information which helped develop the research design, such as a suggestion to expand the research to focus not only on the Bandung City level but to include the regional scale in Metropolitan Bandung. This suggestion was discussed during the interview with planners in the National Planning Board. Indeed, many more aspects can be dug from a broader geographical scope which will not be found from a smaller scope, such as the complex interaction between governments at different levels.

Before the fieldwork, I participated in an International Workshop in Yogyakarta entitled “Adopting an R-Urban Model: Empowering Local Communities to Develop Sustainable Built Environment”, discussing sustainability in the context of the relationship between governments and the local community. An academic in the field of Public Administration from a well-known university in Bandung attended the workshop, and I took the opportunity to interview her at the end of the workshop, as my analytical partner criticising the current planning and implementation system in Indonesia. The research activities during the first fieldwork can be seen in Table 2.1.

Table 2.1 Research Activities during the First Fieldwork in Indonesia

Date	Location	Research Activities
29 Nov– 4 Dec 2016	Yogyakarta	Participating in an International Workshop in Jogjakarta, Indonesia
4 Dec 2016	Yogyakarta	Interview with an academic from Parahyangan University met in the International Workshop
5 Dec 2016	Jakarta	Group discussion with officials and staff of the Ministry of Public Works
6 Dec 2016	Jakarta	In-depth individual interviews with planners in the Indonesian National Planning Board
7 Dec 2016	Bandung	Group discussion with officials and staff of West Java Provincial Government, Bandung City Government, Bandung City Water Company, and Ministry of Public Works based in Bandung
8-9 Dec 2016	Bandung	In-depth individual interviews with an official from West Java Provincial Government and an academic
12 Dec 2016	Jakarta	In-depth individual interviews with staff in Ministry of Public Works and Housing

Group Discussions

Two group discussions were conducted in Jakarta and Bandung. The first group discussion in Jakarta was attended by government officials in the Ministry of Public Works and Housing which deal with the development of the water supply. The other group discussions were held in Bandung and attended by government officials from the West Java Provincial Government, Bandung City Government, and Bandung City Water Company (Tirta Wening). The participants in the discussions were various, from the divisions of planning, programming, budgeting, and the technical division of water development.

At this stage, issues and questions discussed in the group discussions were meant to explore what happened around the programme of regional water supply development Metropolitan Bandung. Group discussions in Jakarta were expected to explore issues at the central government level since untreated water intake and water treatment plants have been constructed by the Ministry of Public Works and Housing. It is also intended to explore the broader national system on planning, programming, and project management related to the programme.

The group discussion in Bandung explored what is happening, but this time at the provincial and local level, including how the related projects were executed in the field. Thus, both group discussions remained at the exploration stage to obtain a wider view of the situation. Furthermore, for more stimulating and less understandable subjects, more in-depth discussions were done through individual interviews.

Twenty-one people participated in the group discussions (Table 2.1). The role of participants in their respective office is diverse, from the technical staff to the administrator and manager. Although they have different positions, the discussions ran smoothly and productively, and many useful responses were received towards answering the research question.

The participants were selected by looking at the organisational structure, and their tasks, in the Ministry of Public Works and related institutions in West Java Provincial and Bandung City government. The selection also considered suggestions from colleagues in the Ministry on which organisation units were involved in the development of the regional water supply in Metropolitan Bandung.

After identifying the related institutions and organisation units, invitations for the group discussions were set up and distributed. The invitation was signed by the Head of the Bureau of Budget Planning and International Cooperation in the Ministry of Public Works and Housing, in the expectation of gathering competent officials and senior staff to become involved in the group discussions. The invitation also included a brief explanation of the aim of the research, the objective of the group discussion, and what was expected from each organisational unit. As a result, most of the invitees sent their competent staff, as can be seen from their generally confident responses during the discussions.

Each group discussion started with an explanation of the purpose of this research and the reasons for involving the attendees. The researcher also asked the attendees for their consent to audio recording the discussions and there was no objection. Ethical issues and risks were also discussed in the beginning, especially concerning their anonymity, and how the recorded audio will be transcribed and the outcomes from the discussions presented in the thesis. This explanation was always done in each of group discussion and individual interview.

During the discussions, besides listening to every answer from each of the individual participants, which was always audio recorded, the participant's body language and voice tone were observed. Only a few participants, particularly the new

staff in their current positions, sometimes showed hesitation and were unsure about their answers and did not become very involved in the discussions. However, overall discussions resulted in getting updated information on the current issues as expected.

Although the discussions were productive, some issues needed to be explored more deeply by conducting individual interviews. One reason for doing these is when the individuals are hesitant to say something in the group discussion. Such an interview can be held with the same person or with their colleagues or superiors. Another reason is when participants state certain information without any supporting data, and therefore the researcher can visit their office to obtain the evidence.

All the group discussions were conducted in a conversational mode, or what Yin (2011) terms a qualitative interview. Nevertheless, guided questions were prepared in advance to direct the discussions. Improvisation occurred during the discussions following the development of the discussion or a particular response from the participant.

All the group discussions were held during the first fieldwork. Overall, the two group discussions ran smoothly. Having previous networking and cooperation with the attendees and experience of conducting similar discussions in the past helped the researcher organise the events successfully. The assistance from colleagues in distributing the invitations was the other aspect supporting the success of the group discussions.

In order to make the discussions lively with free explorative talk from the attendees, all group discussions were in the Indonesian language (Bahasa). The recorded audio was then transcribed and remains in Indonesian. Furthermore, important statements from the group discussions and individual interviews were translated into English with the closest meaning, while verbatim translations were made only for sentences quoted in this thesis.

By looking at the purpose of the first fieldwork to validate the previous knowledge and understanding and to refocus the research topics, the two group discussions reached their goals. Information gathered from the discussions completed the picture of the national system in Indonesia, alongside information about the programme of regional water infrastructure development in Metropolitan Bandung. However, information gaps that had not been gathered from the groups were then drawn from individual visits to the respective institutions.

Individual Interviews in the First Fieldwork

Individual interviews played crucial roles in this research. Most of the primary data for the analysis came from this means of data collection. Besides completing information from the group discussions, the results from individual respondents gave a broader yet deeper understanding of the problems addressed in this research. This is because during the interview, as expected by Firmin (2008), the researcher was given the freedom to think creatively while the interviews took place.

Individual interviews were also conducted in order to obtain a deeper understanding of certain issues. As well as enriching resources for analysis with an insight into the water supply industry, some interviewees also gave ideas on how this research would effectively be conducted and the outcomes from the research could be utilised. The previous professional relationship between interviewees and the researcher helped make the interviews more interactive and productive.

As for group discussions, the previous professional relationship which existed between most of the interviewees helped the process to run smoothly. Additionally, because the latest position of the researcher was as a central government official, this provided access to many officials from the provincial and city government and the Bandung City Water Company. There were no significant problems with bureaucratic procedures, as usually encountered by the non-government researcher.

Besides interviewing government officials and staff, there were interviews with academics as critical partners. Although some of the interviewees from government officials gave their internal criticism, interviews with academics revealed different views, as the academics gave a broader view of the discussed issues and some interesting facts that were not covered by the other informants.

After identifying institutions to visit, the next step was to find a person with the expected knowledge and competency, i.e. someone with several years in the relevant field or an understanding of a process in the development of water infrastructure. Otherwise, the researcher chose the further persons, either their colleague, superiors, or their staff. This selection of interviewees had a positive effect as most of the interviewees gave their answers very confidently.

Individual interviews were conducted during both the first and second fieldwork periods in the Indonesian language. In total, 28 people were interviewed individually, with 10 interviewees in the first period (Table 2.4) and 18 in the second (Table 2.7), including two persons who were interviewed in both. The total number of individual

interviewees seems fewer than the total of 23 participants in two group discussions (16 participants in Jakarta and seven participants in Bandung), but the information gathered was much more.

For interviews with academics, the criteria in selecting the interviewees were that they should: be from Bandung or know the region well; be knowledgeable about the national development system; understand the development process of water supply infrastructure. As a result, two academics in the discipline of public administration and infrastructure planning from reputable universities in Bandung were chosen.

The other individual interviewees were the current and future end users of Bandung Water Company. They were chosen to talk about the problems of the water supply service from the perspective of the end user. Interviews with future beneficiaries were also needed to understand their expectations of the service and how they had survived thus far without a water supply from the piping system.

Almost all the interviews were conducted in a conversational mode. As also suggested by Yin (2011), the advantages of qualitative interviews in a conversational mode are that they may explore and dig for in-depth information from the interviewees. The other reason for conversational mode interviews is because this research was not a survey or poll but a qualitative study. There were only two interviews conducted in a more structured way, as requested by the interviewee who was a Planning Director in the Ministry of Public Works and Housing and an Administrator in the Ministry of Agrarian Affairs and Spatial Management.

Furthermore, making use of communication technology and existing relationships, interviews from a distance were also conducted to fill information gaps or clarify particular recorded statements. These were done either by telephone for a more extended conversation or by text when only shorter answers or confirmation was needed. These helped to complete the required information that was not expected until the time of writing the thesis.

List of Interviewees

The following tables show the list of informants of the interviewees from the first fieldwork, both from the two group discussions and individual interviews. There were 37 interviewees in total, 23 informants from two group discussions, and 14 individual interviewees including four interviewees from unplanned interviews.

Table 2.2 shows attendees in the first group discussions held in an office in the Ministry of Public Works. Looking at the purpose of the first fieldwork as a scoping study, the invitees were intended to be from the Ministry of Public Works and Housing as the leading ministry in constructing water supply infrastructure.

The invitations were addressed to the head of organisational units deal with water supply. Formulation of invitees was considering the function of each organisation unit to cover all the aspects of organisational processes for water supply development, from planning processes until the evaluation of a programme and related projects.

Table 2.2 Attendees of the Group Discussion in Jakarta

Institutions	Attendees	Further Communications
Ministry of Public Works and Housing		
▪ Directorate of integration for human settlements infrastructure	2	Text messages
▪ Sub-Directorate of a technical plan for water supply development	1	Text messages
▪ Sub-Directorate of Raw/Untreated Water	1	-
▪ Regional Infrastructure Development Agency	4	-
▪ Bureau for Budget Planning and International Cooperation	8	Text messages
Total	16	

After the first group discussion in Jakarta, another group discussion was held in Bandung. As for the first group discussions, invitations were addressed to the head of closely related organisational units with the regional water development in Metropolitan Bandung. In the case that the invitees are unable to attend the group discussion, they may send somebody else, e.g. their staff, to participate in the discussion.

The attendees were from West Java Province and Bandung City government offices, Bandung City Water Company, and offices of the Ministry of Public Works and Housing based in Bandung City. As with the first group discussions, attendees were further contacted to give additional information or clarification when necessary. Table 2.3 shows the attendees of the second group discussion in Bandung.

Table 2.3 Attendees of the Group Discussion in Bandung

Institutions	Attendees	Further Communications
I. Ministry of Public Works and Housing		
▪ Citarum River Basin Agency	2	Text messages
▪ Working Unit for Water Supply Development in West Java Province	1	E-mail and text messages
II. West Java Provincial Government		
▪ Water supply division, West Java Settlements and Housing Agency	1	E-mail and text messages
▪ West Java Development Planning Agency	1	Text messages
III. Bandung City Government		
▪ Bandung City Development Planning Agency	1	-
III. Bandung City Water Company		
▪ Planning division	1	E-mail and text messages
Total	7	

Table 2.4 shows the list of individual interviewees during the first fieldwork, which most of them were conducted in Jakarta and Bandung. However, one interview was conducted in Jogjakarta with an academic from Parahyangan University, while we were participating in the same international workshop.

Table 2.4 Individual Interviewees during the First Fieldwork

Institutions	Interviewees	Further Communications
I. Central Government		
<i>Ministry of Public Works and Housing</i>		
▪ Sub-Directorate of a technical plan for water supply development	1	-
▪ Bureau for Budget Planning and International Cooperation	3	Text messages
▪ Working Unit for Water Supply Development in West Java Province	1	E-mail and text messages
<i>Ministry of National Development Planning</i>		
▪ Directorate of Urban, Housing, & Settlements	2	-
II. West Java Provincial Government		
▪ Water supply division, West Java Settlements and Housing Agency	2	E-mail, and text messages
III. Academics		
▪ Public administration study programme, Parahyangan University, Bandung	1	-
▪ School of Architecture, Planning, and Policy Development, Institut Teknologi Bandung	1	-
Total	10	

There were unplanned conversations with colleagues in the Ministry of Public Works and Housing, but these can be included as interviews since the interviewees gave information for the research. Four interviewees from different organisation units shared various information about the technical water supply system to the current evaluation system in the ministry.

Table 2.5 Unplanned Individual Interviews during the First Fieldwork

Institutions	Interviewees	Further Communications
I. Central Government		
<i>Ministry of Public Works and Housing:</i>		
▪ Sub-Directorate of a technical plan for water supply development	1	Text messages
▪ Bureau for Budget Planning and International Cooperation	3	Text messages

Instruments for Data Collection

“Memories are finite” (Firmin, 2008: 190), and this is the main reason for taking notes and audio recording all the interviews. Besides avoiding the loss of important information and synchronising all the recording tools, the purpose of storing all types of records is to keep this research accountable for future investigation.

Two instruments were used during the interviews, namely written notes and digital audio recorders. While an audio recorder was used to record all the conversations, the written notes were only used for the main or important information stated by interviewees. A video recorder was not used because the presence of a camera is likely to distract the interviewees and result in more restricted answers.

As discussed earlier, the use of a digital audio recorder as a research instrument was notified in advance to the interviewees, who were free to choose whether they wanted to continue the recorded interview, continue without an audio recorder, or withdraw from the interview after listening to a short explanation about the research from the researcher. No audio recorder was used without prior verbal consent from the participants.

Several unplanned interviews happened unexpectedly when meeting somebody whom it was believed could give additional information to the study. These took place in an office corridor or canteen. On these occasions, the researcher relied on memory and note taking using a smart phone and recapped to more complete notes after finishing the meeting.

In order to secure recorded interviews, data backup was done every evening during the fieldwork. As well as keeping the audio files in the recorder, the files were stored in a personal computer, external hard drive, and memory stick. For the written notes on paper, a photograph of the notes was taken and backed up in the same devices as the audio files. Another back up was done by sending the files to self-email.

2.4.5 The Second Fieldwork: In-depth Study

Besides considering the outcomes from the first fieldwork, planning for the second fieldwork was to take a more advanced literature review. While the first fieldwork was intended as a scoping study and a means of opening communication with key informants, the second was an opportunity to fill gaps in information from the first fieldwork and look at the latest progress of the development of regional water supply development in Bandung. Thus, the second fieldwork was more focused on in-depth interviews.

This second fieldwork was also used to present and confirm the preliminary findings of the research. The presentation was given to the related government officials and staff, and at the other time to academics and practitioners in an international conference in Indonesia.

Fieldwork Timeline

Besides conducting the second fieldwork with the main purpose of interviewing key informants in Bandung and Jakarta, I also participated in an International Conference discussing infrastructure development entitled, “Transforming beyond Borders, Starting the New Urban Agenda” held in Bandung. Table 2.6 shows the main research activities during the second fieldwork.

Another important activity related to this research was the presentation of the initial findings to an official in the Ministry of Public Works on the last day of the fieldwork. This included all the findings from the first and the second fieldwork and discussed the initial proposition from this research to address the problem of synergy in the development of water supply development in Indonesia, learning from the case of Metropolitan Bandung.

Table 2.6 Research Activities during the Second Fieldwork in Indonesia

Date	Location	Research Activities
13-20 March 2018	Jakarta	Individual interviews
21-30 March 2018	Bandung	Individual interviews
2-4 April 2018	Institut Teknologi Bandung	Participating in an International Conference
9-12 April 2018	Jakarta	Individual interviews
13 April 2018	Jakarta	Presentation of initial findings to an official in the Ministry of Public Works

Individual Interviews in the Second Fieldwork

The main activities in the second fieldwork were individual interviews with the personnel from central, provincial, and local government, and beneficiaries. There were 18 interviewees in total. Since it was a more in-depth study, the second fieldwork was allocated an intensive month, four times longer than the first fieldwork, in Jakarta and Bandung.

Two interviewees were the same as in the first fieldwork, from the Working Unit for Water Supply Development in West Java Province and from Water Supply Division under West Java Provincial Government. The former was involved in water treatment construction and the latter constructed the main distribution pipeline.

Interviews in the second fieldwork were conducted to fill information gaps, especially in how they dealt with the local people affected by construction. Additionally, the interviews were also needed to obtain the latest information on the progress of the South System development of the regional water supply infrastructure in Metropolitan Bandung.

Interviews with 13 new informants were needed after reviewing information gathered from the first fieldwork and by considering the outcomes from the literature review. There was also a need for an in-depth conversation with the local water company to obtain their perspective on how the government on various levels was working together and when it was doing so. There was also a need to understand more about how spatial plans regulated the development of the water supply, and how the regional water supply development should be administered, and so on. Accordingly, the interviewees were selected based on these needs, and the detail can be seen in Table 2.7.

Table 2.7 Recap of the Interviewees in the Second Fieldwork

Institutions	Number of Interviewees	Further Communications
I. Central Government		
<i>Ministry of Public Works and Housing:</i>		
▪ Directorate of integration for settlements infrastructure	1	-
▪ Sub-Directorate of water supply development for special area	1	Face to face individual interview for several times
▪ Bureau for Budget Planning and International Cooperation	2	Text messages
▪ Working Unit for Water Supply Development in West Java Province	2	E-mail and text messages
<i>Ministry of Agrarian Affairs and Spatial Management</i>		
▪ Directorate of Special Area Management	1	Text messages
▪ Sub-Directorate of regional assistance for Java Island	1	-
II. West Java Provincial Government		
▪ Water supply division, West Java Settlements and Housing Agency	3	E-mail and text messages
▪ West Java Development Planning Agency	2	-
III. Bandung City Water Company		
▪ Planning division	1	E-mail and text messages
IV. End users		
▪ Current customers	2	Text messages
▪ Future beneficiaries	2	Text messages
Total	18	

In order to make the discussions lively with free explorative talk and ideas from the attendees, all group discussions were conducted using the Indonesian language (Bahasa). As for the other interviews and discussions, the recorded audio was then transcribed into text, which remains in Indonesian. Furthermore, the primary ideas from the interviews were translated into English more freely, while verbatim translation was done only for quoting statements.

Secondary Data Collection

As discussed earlier, most of the data for the analysis were taken from primary sources from individual interviews and group discussions. Nevertheless, secondary data are also essential for certain reasons, such as to introduce problems addressed in this research and the importance of this research, by supporting qualitative statements in the form of numbers and maps, and so on.

Table 2.8 Primary Secondary Data from the Second Fieldwork

No.	Data	Sources
1.	Power point presentation entitled “ <i>Kebijakan Pengembangan SPAM</i> [Policies on the Development of Domestic Water Supply System]”	Presented by Antono (2008)
2.	Maps showing service area of pipeline based water supply in Bandung City	Bandung City Water Company
3.	Maps showing the pipeline network for the first phase of water supply development in Metropolitan Bandung	West Java Settlements and Housing Agency

Few items of secondary data were needed. Planning documents that can be downloaded from the internet, such as national development plans and West Java Province and Bandung City development and spatial plans, which contain data on water supply and geographical characteristics of Bandung, helped fulfil the need to introduce the background of this research. An important document gained from the fieldwork was a PowerPoint presentation by Antono (2008), which covers policies and plans for the national development of water supply in Indonesia.

The other critical secondary data were from Bandung City Water Company and the water supply division of West Java Settlements and Housing Agency. The data are in the form of maps that show the area in Bandung City covered by pipeline-based water supply and maps showing the constructed pipeline system of the regional water supply infrastructure in Metropolitan Bandung.

One of the issues in using secondary data is validity. Only the data from reliable and convincing sources are used. Data from government web pages were not utilised at once, but were following a cross-check with the related officials, when possible, or other reliable sources. Likewise, with the data from non-government institutions such as news web pages, although used at a minimum, were also used with a prior re-check and triangulated with the other data sources.

The other issue concerns outdated data. Since the research took more than three years, it was possible that the first quoted figures had changed. Therefore, most of the secondary data were collected during this second fieldwork in 2018 to ensure that the data provided in this thesis was as recent as possible. The researcher also requested that some of the interviewees provide an update on what they had given before.

Confirmation of the Interim Findings

During the second fieldwork, interim findings were presented at two events: at the Ministry of Public Works and Housing in Jakarta, and at an international conference in Bandung on financing for infrastructure in Indonesia. There was an exchange of knowledge when reporting the interim findings to the officials and staff in the Ministry of Public Works and Housing. Some parts of the researcher's literature review were adopted by the ministry, and the office provided an update of secondary data as presented by Antono (2018). There were also constructive discussions with the participants and encouraging input that the outcome of this research would be beneficial as a basis for future policies and guidelines.

The second presentation in Bandung discussing infrastructure development in Indonesia was also constructive in different ways. The participants, who were mostly academics, practitioners, and students, appreciated how this research would be beneficial academically and in practice for the context of Indonesia. One of the workshop panellists shared encouraging feedback to continue the research and had expectations for the coming results.

Thus, the second fieldwork was conducted as expected and the gathered information, data, and knowledge were used to finalise the literature review, answer the research question, and examine the research's proposition.

2.4.6 Examining the Proposition

The milestones in the research, as seen in Figure 2.2, show how the research stages were used, after the iterative process between the literature review and the two fieldwork periods, to formulate the proposed concept. First, the proposition on a proposed concept for the Spatial-based Programme Approach was examined. This stage was conducted to check whether the proposition was a convincing concept or required revision.

Thus, to examine the proposition addressing the problems of hindering the synergy of the development of the regional water supply in Metropolitan Bandung, three steps were taken:

1. Understanding Programme Character and Needs

Exploring and understanding the character of the water supply programme in Indonesia was essential to formulate the correct management approach. The challenges and advantages from internal and external factors needed to be thoroughly analysed to arrive at a convincing solution to tackle the problems and formulate strategies to utilise and more permanently apply the approach.

2. Elaborating the Proposed Concept and Alternative Concepts

The need to manage the water supply development programme, as analysed earlier, was then compared and matched with the available management approaches. During the fieldwork, interviewees also suggested ideas how to manage such complex programmes for the development of water supply system.

3. The Decision over the Proposed Concept

The decision was made by considering the outcomes from the first two steps, with three possibilities: to accept the proposed concept, to accept it with some adjustment, or reject it and find another approach.

2.4.7 Application of the Concept

As suggested by Kovács and Spens (2006:139), research following the abductive approach should conclude with the application of a conclusion or the application of the proposed concept. In this research, the application of the conclusion is translated as the application of the chosen concept decided upon in the process described above.

One of the advantages of formulating a strategy for the proposed concept is to bridge the concept and its implementation. This research also formulated utilisation strategy for how to implement the chosen concept sustainably. In the case of water supply infrastructure development in Indonesia, this means the incorporation of the concept into the practical management of the programme.

The lessons learnt for formulating the application strategy were taken from the development of the South System of the regional water supply infrastructure in Metropolitan Bandung. Furthermore, the proposed concept and its utilisation strategies are expected to be utilised in the future programme of water supply development in Indonesia.

2.5 Methods of Analysis

According to van den Hoonaard and van den Hoonaard (2008), the analysis of qualitative data involves several standard features that have also been applied in this research, as follows:

- An iterative process between data collection and analysis. For this research, the early review on already collected data was conducted during the data collection process. The outcomes of this analysis were used to revise interview guidelines and to refocus future interviews.
- The development of connections between the collected data, concepts in the literature review, and the analysis. This research analysed the collected data, using the literature review as guidance for this process.
- An analysis of data involves some form of coding. This was implemented by writing memos and using coding both during and after data collection.
- Writing up the data as soon as possible, though not in the form of chapters. This suggestion was also applied with the expectation that it would help arrive at a more profound analysis of the data.
- All data analysis moves toward developing concepts or relating to already existing concepts. This flow is in line with the abductive process used for this research.

In terms of analytical methods, there are three main methods in this research, namely exploratory analysis, a Strength-Weaknesses-Opportunities-Threats (SWOT) analysis, and explanatory analysis. The following Sections discuss these methods in detail, but begin by discussing the data preparation.

2.5.1 Data Preparation

When qualitative researchers speak of analysing data, they mean that participants' words or other empirical evidence were assessed (Firmin, 2008). As discussed earlier, most of the data for analysis were in the form of words in audio-recordings and written notes. Accordingly, correct methods of audio filing and the coding of audio recordings were essential.

This research did not need to translate verbatim all the statements made, since the analysis of the interviews was not conducted word by word. However, in the end, all the oral statements were transcribed to avoid missing important information.

Verbatim translation was only performed for the purpose of quoting essential statements to support a argument.

Simple coding of the audio files was done by naming each file with a unique but easily recognisable name. For example, GD.1.JKT was the code for the first group discussion (GD) held in Jakarta. Coding was also used in the raw text for analysis, for example, GD.1.JKT 12.10-12.35” indicates the statement is on the Jakarta group discussion file, at time point 12 minutes and ten seconds to 12 minutes and 25 seconds. The passage between these time points was transcribed verbatim.

Another issue in preparing the data for analysis was translation, because all the interviews were conducted in the Indonesian language. For this research, the translation was left until a section was identified which needed to be quoted verbatim. Otherwise, the text remained in Indonesian to avoid losing the level of nuance or a particular message that the interviewees had tried to deliver beyond the transcribed sentences.

2.5.2 Exploratory Analysis

Exploratory data analysis is the set of steps that qualitative researchers follow in exploring a new area of social life (Stebbins, 2008). Based on the outcomes from the first fieldwork, exploratory analysis was applied in this research to complete the puzzle of the whole processes of water supply infrastructure development.

Before discovering all the processes on the development of the regional water supply in Metropolitan Bandung, a large framework describing the whole development process was needed. This framework was constructed through a literature review, as presented in Chapter 3. Using this framework, all the processes in the case study were analysed.

A type of exploratory analysis was used to write Chapter 4, which analyses the Indonesian national and regional/local development system in general, and Chapter 5, on water supply development in Metropolitan Bandung. Output from these analyses was used to feed the examination of the proposed concept for answering the problem addressed in this research, i.e. the development of a Spatial-based Programme Approach.

2.5.3 SWOT Analysis

While an exploratory analysis seeks to discover all potential challenges, a SWOT analysis is used to structure these problems, and consider positive sides. The SWOT analysis focuses on Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T) facing an organisation. By using a SWOT analysis, the internal and external factors affecting the preparation and implementation of the regional water infrastructure development could be examined.

Stacey (2011: 76) defines a SWOT analysis as a list of an organisation's strengths and weaknesses, as indicated by an analysis of its resources and capabilities, plus a list of the opportunities and threats that an analysis of its environment identifies. Besides discovering problems and potential, this analysis also bridges the development of a strategy to overcome problems.

Although the SWOT analysis is a simple tool, it is useful for structuring issues and can lead to a clearer view of the problems, which in turn leads to better solutions. As Mullins (2010: 545-546) argues the SWOT analysis provides convenient headings under which to study an organisation in its environmental setting and may provide a basis for decision-making and problem-solving.

Mullins (2010: 546) describes the meaning of each of term. "Strengths" are the positive aspects or distinctive attributes or competencies which provide a significant advantage, or upon which the organisation can build. "Weaknesses" are those negative aspects or deficiencies in the present competencies or resources of the organisation, or its image or reputation, which limit its effectiveness and need to be corrected or have action taken to minimise their effect. "Opportunities" are favourable conditions and usually arise from the nature of changes in the external environment that provide the potential for the organisation to offer new, or to develop existing, products, facilities or services. "Threats" are the converse of opportunities and refer to unfavourable situations that arise from external developments likely to endanger the operations and effectiveness of the organisation. Figure 2.3 shows how the list of strengths, weaknesses, opportunities, and threats is structured.

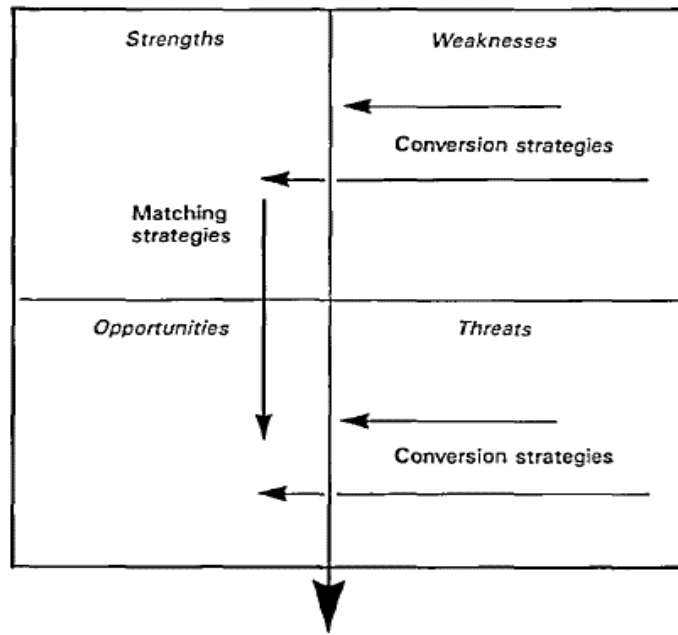


Figure 2.3 Diagram of SWOT Analysis

Source: Piercy and Giles (1989: 6)

Furthermore, in formulating strategies to address problems, as highlighted by Pickton and Wright (1998), future actions should match the strengths with opportunities, ward off threats, and overcome weaknesses. Figure 2.3 by Piercy and Giles (1989) shows strategic approaches that need to be taken, to convert weaknesses and threats to become strengths, and to use strengths in collaboration with external opportunities.

In order to overcome the issue of the inherent simplicity of a SWOT analysis, Pickton and Wright (1998) suggest conducting a more detailed analysis using complementary frameworks. Therefore, for this research, the SWOT analysis was supplemented by an explanatory analysis, as discussed in the following Sections. The SWOT analysis of the case study is presented at the end of Chapter 5.

2.5.4 Explanatory Analysis

The term explanatory implies that the research in question is intended to explain, rather than merely describe the studied phenomena (Maxwell and Mittapalli, 2008b). Berg (2001) and other authors have suggested that explanatory case studies are useful when conducting causal studies. From the other perspective, Maxwell and Mittapalli (2008a) recommend seeing causality as referring to the actual mechanisms and processes that involve events and situations.

Accordingly, this study's analysis using the explanatory approach was not limited to explaining causal relations, but also tried to explain what happens, why it happens, and what might happen if the particular aspect were changed or potentially changed. As Maxwell and Mittapalli (2008a) note, an explanatory analysis lays emphasis on understanding the processes.

The explanatory approach was used for the analysis of all the processes and at each stage in detail, as the basis for examining the proposed Spatial-based Programme Approach, and to achieve the expected outcomes of water infrastructure development. This analysis utilised the outcomes from the SWOT analysis to suggest a preferred solution to the problems addressed in this research.

The explanatory analysis also incorporates qualitative researchers' emphasis on the role of actors, and the unique contextual circumstances (Maxwell and Mittapalli, 2008a). It was therefore also used to analyse the organisational setting which supports the development of the regional water supply infrastructure in Bandung, with its unique relations between actors. Finally, explanatory analysis was used to write Chapters 6 and 7.

2.6 Standard of this Research

In order to conduct a high quality and rigorous research process, scientific inquiry was the first concern. Other concerns were: maintaining the reliability and validity of the research through an accountable and coherent process; being ethically correct; and, ensuring the report was written thoughtfully. This Section discusses the various aspects implemented to maintain high research standards.

2.6.1 Scientific Inquiry

Scientific inquiry was one of the main principles of this research, and was undertaken through at least six principles, as suggested by National Research Council (2002), as follows:

- Pose significant questions that can be investigated empirically
The question and research designs were based on an understanding of the relevant theoretical, methodological, and related empirical works, especially in the field of programme management and spatial planning.

- **Link research to relevant theory**
This research linked, either implicitly or explicitly, to overarching theory or the conceptual framework that guided the entire investigation.
- **Use methods that permit direct investigation of the question**
The link between the research question and methods was explained and justified by indicating how a particular method enabled the investigation of the research question.
- **Provide a coherent and explicit chain of reasoning**
This research kept the chain of reasoning as coherent as possible, explicit enough for another researcher to replicate, and persuasive to counterargument.
- **Replicate and generalise across studies**
Replication and generalisation strengthen and clarify the limits of scientific conjecture and theory. This research offered a clear justification for generalisation from a case study.
- **Disclose research to encourage professional scrutiny and critique**
Scientific studies do not contribute to a larger body of knowledge until they are widely disseminated and subjected to professional scrutiny by peers. The interim findings of this research were disseminated at two events, an international conference in Bandung, and a presentation to officials and staff of the Ministry of Public Works.

2.6.2 Reliability and Validity

Miller (2008) believes that reliability in qualitative research, unlike in quantitative research, is best approached on a case-by-case basis. Nonetheless, there is no agreed definition of reliability in qualitative research. Many publications in qualitative research correlate reliability to the concepts of credibility, dependability, stability, consistency, and equivalence.

Miller (2008) suggests three of the commonly cited indicators of credibility and dependability that have been the guiding principles of this research:

- **Methodological coherence:** the appropriate and thorough collection, analysis, and interpretation of data;
- **Researcher responsiveness:** the early and ongoing verification of findings and analyses with study participants; and

- Audit trails: a transparent description of all procedures and issues relative to the research project.

Additionally, in order to test reliability of a qualitative work, Brink (in Long and Johnson, 2000) proposes three tests of tests, where each one to be used is appropriate for specific aspects, such as stability, consistency, and equivalence. Stability is established when participants are asked identical questions at different times and consistent answers are produced. Consistency refers to the integrity of issues within a single interview or questionnaire, so that a respondent's answers on a given topic remain concordant. Equivalence is tested using alternative forms of a question with the same meaning during a single interview, or by the concurrent observation of two researchers.

Regarding validity, Long and Johnson (2000) argue that this is normally established through the consideration of three main aspects: content validity, criterion-related validity, and construct validity. Content validity depends largely on sampling and the careful construction of the instrument and refers to the degree to which the entirety of the phenomenon under investigation is addressed. A subset of this factor is the weak concept of face validity, which assures only that the instrument and findings appear to be thorough and accurate to reputedly knowledgeable reviewers.

Criterion-related validity is concerned with comparison of the instrument and findings with an established standard to determine the correlation between measured performance and actual performance. Finally, construct validity is associated with consideration of the proximity of the instrument to the construct in question.

Miller (2008) notices that most qualitative researchers agree that validity is heightened by ensuring that research procedures remain coherent and transparent, research results are evident, and research conclusions are convincing. Validity, from this perspective, is increased by researchers' use of specifically prescribed and well-entrenched procedures and strategies.

For the sake of integrity and enhancing the findings' internal validity, interview data are compared with information obtained from other sources (Firmin, 2008). After qualitative researchers have drawn tentative conclusions about their findings, they often return to the study's participants and check their findings, to garner feedback.

In order to improve reliability and validity, Patton (1999) and Maxwell (1998) recommend several techniques to enhance the quality of analysis, and these were followed in this research, namely:

- **Obtaining Rich Data**

“Rich” data are detailed and complete enough to provide a full and revealing picture of what is going on. In interview studies, such data generally require verbatim transcripts of the interviews, rather than simply notes on what you noticed or felt was significant. The key function of rich data is to provide a test of your developing theories, rather than simply a source of supporting instances.

- **Testing Rival Explanations**

Once the researcher has described the patterns, links, and plausible explanations through the analysis, it is important to look logically for rival or competing themes and explanations.

- **Negative Cases**

Closely related to the testing of alternative constructs is the search for negative cases. Where patterns and trends have been identified, our understanding of those patterns and trends is increased by considering the instances and cases that do not fit within the pattern.

This section of a report reads something like a detective study in which the analyst (detective) looks for clues that lead in different directions and tries to sort out the direction that makes the most sense given the clues (data) that are available.

- **Triangulation**

The logic of triangulation is based on the premise that no single method ever adequately solves the problem of rival explanations. The point is to test for consistency. Different types of data may yield different results because different types of inquiry are sensitive to different real-world nuances.

Cox (2008) argues that in social research the term triangulation is associated with the use of multiple methods and measures of an empirical phenomenon in order to reduce bias and improve convergent validity, which is the substantiation of an empirical phenomenon through the use of multiple sources of evidence.

- **Reconciling Qualitative and Quantitative Data**

Methods triangulation often involves comparing data collected through a qualitative method with data collected through a quantitative method.

- Feedback

Enquiring feedback from others is useful to identify validity threats, own biases and assumptions, and flaws in logic or methods. It is recommended to ask feedback from a variety of people, both those familiar with the research topic or settings you are studying and those who are strangers to them. These two groups of individuals are likely to give different comments, but both are valuable.

2.6.3 Ethical Issues

In relation to social research, ethics refers to the moral deliberation, choice and accountability on the part of researchers throughout the research process (Edwards and Mauthner, 2005: 14). The frequent discussions on ethics in qualitative research arise because the researchers work with participants face to face, over lengthy times, and sometimes in very intimate situations (Preissle, 2008).

Preissle (2008) believes that research ethics also address the integrity of the research activity. Accordingly, this research committed to honesty, openness, and candid revelation of the study's strengths and limitations according to commonly held standards of practice. This research was also open to all participants who wished to look at what was going to be presented about them.

Additionally, all risks were discussed with research participants beforehand, to inform them about the research, what kind of data were needed from them, and how the data would be analysed. During the data collection process, the participants could continue or withdraw from the process. Where necessary, it was possible to provide them with anonymity and confidentiality in the keeping of data sets.

The other ethical considerations of this research related not only to humans as research participants. Since this research used a great deal of government data, the issue of state secrets was also considered. A confirmation stage with related government officials was always undertaken for data which had not been released to the public.

In addition to this, some names of interviewees were not mentioned in the thesis, to protect them from further investigation by internal and external auditors, especially when the interviewee's errors were noted in the thesis. Moreover, the investigation of the consistency between planning, budgeting, and project implementation has now intensified at the central government level and probably with provincial and local governments as well.

This page is intentionally left blank

CHAPTER 3

ORGANISATIONAL PROCESSES AND STRUCTURES OF PHYSICAL INFRASTRUCTURE DEVELOPMENT

CHAPTER 3 ORGANISATIONAL PROCESSES AND STRUCTURES OF PHYSICAL INFRASTRUCTURE DEVELOPMENT

3.1	Introduction	55
3.2	The Organisational Processes and Structure	55
3.2.1	Organisational Processes.....	55
	<i>Work Processes</i>	56
	<i>Behavioural Processes</i>	57
	<i>Change Processes</i>	58
3.2.2	Organisational Structure.....	59
	<i>Formal Configuration of Organisational Structure</i>	61
	<i>Informal Dimension of Organisational Structure</i>	61
3.3	Basic Framework of the Organisational Processes	62
3.3.1	Policy-Planning-Implementation Process Model.....	62
	<i>The Basic Model of PPIP</i>	63
	<i>Variations in the PPIP Model</i>	64
	<i>The Use of the PPIP Model</i>	67
3.3.2	Formulating a Strategy for Programmes and Projects	68
	<i>Overview of the Processes</i>	69
	<i>Adjustments on Definitions of Key Terms from Kor and Wijnen (2007)</i>	70
3.3.3	Production of Organisational Performance	72
	<i>Internal and External Environment and Needs</i>	73
	<i>Objectives and Relevance</i>	74
	<i>Input, Activities, and Output</i>	74
	<i>Outputs, Capability, and Outcomes</i>	75
	<i>Effectiveness and Efficiency</i>	77
3.3.4	Planning, Programming, and Budgeting System	78
3.4	Amalgamated Framework of Organisational Processes	86
3.4.1	The Consolidated Framework.....	87
3.4.2	The Flow of the Framework.....	89
3.5	Organisational Structures of a Programme	90
3.5.1	Typology of a Programme	91
3.5.2	Elements of Integration	93
	<i>Four Elements to Integrate</i>	93
	<i>Spatial Organisation Required</i>	94
3.5.3	The Need to Work Together	95
3.5.4	Possible Programme and Project Risks.....	101
3.5.5	Levels of Importance, Urgency, and Resistance.....	102
3.6	Conclusion	106

3.1 Introduction

This chapter contains literature review on the physical infrastructure development processes and describes every stage from first initiation in the form of needs assessment to the attainment of the outcomes of a programme. Since water supply infrastructure development as the case study is part of the physical development, it is essential to understand this aspect.

The main output from this chapter is a framework of development processes arising from several basic models, and these show the stages within the physical infrastructure development processes. Before discussing the consolidated or superimposed model which describes the whole process as set out in the fourth section, the discussion starts with the original models and their variations.

Although no existing model can present the complexity of real life, models are helpful as the starting point to understand and explain a certain complexity. The use of models to explore, explain, and understand the complexity of the long development process is advantageous because it is much easier to use models than write lengthy descriptions.

Nevertheless, before discussing the models, it is necessary to consider the concepts around organisational processes and structures to see how this research refers to these terminologies. Understanding the concepts is also important since these terms are intensively discussed throughout this thesis.

3.2 The Organisational Processes and Structure

Gaining insight into organisational processes and structures for physical infrastructure development is the first research objective as the basis on which to conduct the analysis and formulate recommendations. The discussion in this Section covers the concepts of these points and their classifications.

3.2.1 Organisational Processes

Garvin (1998) refers to organisational processes as sequences of tasks and activities, and he groups organisational processes into three categories, which were adapted as the focus of this research. Firstly is “work processes”, with a focus on accomplishing tasks by looking at the input-output relationship between the organisations involved.

Secondly, there are “behavioural processes”, which focus on the ways of acting and interacting with organisations. Third, “change processes” that focus on how individuals, groups, and organisations adapt, develop, and grow in the sequence of events over time.

Table 3.1 summarises the three groups of organisational processes of Garvin (1998), and this is followed by a discussion of the work, behavioural, and change processes in more detail in relation to the domestic water sector. Understanding these three groups of organisational processes is essential for the research since most of the discussions during the fieldwork and when analysing the outcomes were related to these types of processes, as the research’s focal points besides the organisational structure of the water sector.

Table 3.1 Organisational Processes Framework

	Work Processes	Behavioural Processes	Change Processes
Definition	Sequences of activities that transform inputs into outputs	Widely shared patterns of behaviour and ways of acting/ interacting	Sequences of events over time
Role	Accomplish the work of the organisation	Infuse and shape the way work is conducted by influencing how individuals and groups behave	Alter the scale, character, and identity of the organisation
Major Categories	Operational and administrative	Individual and interpersonal	Autonomous and induced, incremental and revolutionary
Examples	New product development, order fulfilment, strategic planning	Decision making, communication, organisational learning	Creation, growth, transformation, and decline

Source: Garvin, 1998: 41

Work Processes

While Garvin (1998) defines a process, in relation to work processes, as sequences of activities that transform inputs into outputs, Pentland (2003: 858) defines it as a series of actions, changes, or functions that bring about an end or result. These two definitions of processes suggest that a work process structures the element of input and output, and results in sequential activities or actions.

Furthermore, Garvin (1998) underlines that work processes are accomplished through linked chains of activities which cut across departments and functional groups. These can be grouped into two categories, namely operational and administrative

processes. Operational processes create, produce, and deliver products and services, while administrative processes do not produce outputs but are still necessary for running the process, such as in a form of planning, budgeting, and performance measurement.

The arrangement of efficient work processes is essential for constructing a water infrastructure system. Since the system consists of various sub-systems, such as water intake, water treatment plants, and pipeline distribution, detailed arrangement of operational processes is vital to the efficient running of construction activities. This can be in a form of Detailed Engineering Design, as a technical reference to guide the sequence of construction works.

Understanding the transformation of inputs into outputs, as the primary purpose of the work processes, should also be related to the spatial aspect that also applies to the construction of a water infrastructure system. One sub-system, for example, the water treatment plant, can use input produced by a water intake located in a different land area. Furthermore, a treatment plant produces an output which is channelled to another sub-system in a different place. Therefore, this interrelation between land spaces is evidence of the importance of the spatial aspect.

Beyond construction, various administrative processes must be properly managed. For example, proper planning and design must be conducted to mitigate any negative impact on local people and the surrounding environment. Another example of a well-managed programme is that it is necessary to allocate a budget and provide the required financial support promptly to avoid delays because of financial problems.

Behavioural Processes

Garvin (1998) defines behavioural processes as patterns of behaviour and ways of acting/interacting that are widely shared. Mullins (2010: 7) argues that this behaviour is influenced by patterns of structure, technology, styles of leadership, and systems of management through which organisational processes are planned, directed, and monitored. Garvin (1998) adds that, the other way around, these patterns also reflect an organisation's characteristics, and profoundly affect the form, substance, and character of work processes by shaping how they are carried out.

Garvin (1998) divides behavioural processes into three categories, namely decision-making, communication, and organisational learning processes. They have different roles but share the same characteristics, such as being distributed throughout the organisation, unfolding over time, involving people in diverse departments and positions, and resting on a few critical sub-processes or routines.

Decision-making processes can be lengthy, complex, and slow to change when they involve multiple stages, engage large numbers of people at diverse levels, and are shaped by the administrative, structural, and strategic context (Garvin, 1998). It may be lengthy and complex because an organisation is often seen as an information-processing network with numerous decision points (Mullins, 2010).

Communication processes, coupled with good information, are essential to order and assist effective decision-making within the organisation (Mullins, 2010). The efficacy of the organisation's relationships rests on the quality and richness of interpersonal communication and information processing activities, and on how conflicts are resolved as people go about their work (Garvin, 1998).

Organisational learning is an increasingly important aspect for an organisation with the central theme of rapid learning as an essential ingredient of organisational performance and effectiveness (Mullins, 2010). Garvin (1998) argues to include four broad processes in organisational learning processes, namely knowledge acquisition, interpretation, dissemination, and retention. Over time, this knowledge management as part of the organisational learning becomes more permanent as the organisation's dominant mode or style of learning.

As part of organisational processes, behavioural processes in the case study on the water supply in Metropolitan Bandung were investigated. This is because organisations and individuals with a long interaction can create common goals, such as running the water supply programme. This is based on established relations and interactions for making decisions and communicating, and as a part of the organisational learning processes. Moreover, these organisational processes do indeed influence how effectively the programme outcomes can be achieved.

Change Processes

Garvin (1998) defines change processes as sequences of events over time that describe how individuals, groups, and organisations adapt, develop, and grow. Mullins (2010: 765) argues that the effective management of change is a key factor in

organisational performance and competitiveness and should emanate from the top of the organisation. A more responsive organisation welcomes a demand for organisational change as an opportunity to build new organisational success.

Garvin (1998) says that change processes are explicitly dynamic and intertemporal in order to alter the scale, character, and identity of the organisation. Despite the potential positive outcomes, when considering unsettled dynamic processes, change is often resisted at the individual level, due to fear of the unknown, and the organisational, because of threats to power or influence (Mullins, 2010).

Garvin (1998) classifies change processes into certain dimensions, which may be autonomous or induced. Autonomous processes can be seen from the natural evolution of an organisation because of an internal dynamic. Unlike autonomous changes, induced processes are created or planned. Mullins (2010: 753) argues that most planned organisational change is triggered by the need to respond to new challenges or opportunities presented by the external environment, or in anticipation of the need to cope with potential future problems.

Another classification of change processes by Garvin (1998) is a slow incremental evolution, or alternating periods of stability, and revolutionary change. The incremental evolution of change process refers to changes that occur only in individual parts of the organisation, while revolutionary change affects the entire organisation.

As the first phase of the water supply development in Metropolitan Bandung took around ten years to complete, it is beneficial to look at the changes which were made over time. These change processes show how the involved organisations anticipated and reacted to changes in the external environment or responded to their own internal dynamics.

3.2.2 Organisational Structure

Mullins (2010: 829) defines structure as the pattern of relationships between positions within an organisation, and between members of that organisation, which define tasks and responsibilities, work roles and relationships, and channels of communication. Accordingly, organisational structure can be defined as a mechanism for linking and coordinating people and groups within the framework of their roles, authority, and power (Naoum, 2011: 56). In addition, organisational structure is usually understood to imply an enduring configuration of tasks and activities, including both formal and informal dimensions (Skivington and Daft, 1991: 46).

The purposes and objectives of structure were identified by Mullins (2010) and relate to the focus of this research as follows:

- Organisational structure defines tasks and responsibilities, work roles and relationships, and channels of communication among members of the organisation, so that these are directed towards the goals and objectives of the organisation;
- Structure makes it possible to apply the process of management and creates a framework of order and command, including for the purpose of monitoring the activities of the organisation;
- Structure is used in assessing accountability for areas of work undertaken by groups and individual members of the organisation;
- Structure can be set-up for more flexibility in order to respond to future demands and developments, and to adapt to changing environmental influences.

Skivington and Daft (1991) and Mullins (2010: 333) divide organisational structure into formal and informal configurations. Formal groups are deliberately planned and created by management as part of the organisation structure and to achieve specific organisational objectives. However, informal groups are based on personal relationships and develop irrespective of the formal structure. Informal groups serve to satisfy members' psychological and social needs.

Table 3.2 Formal and Informal Configuration of Organisational Structure

	Formal Configuration	Informal Configuration
Definition	Framework of an organisation with its roles and procedures	Pattern of interactions between organisations involved
Main objective	To establish organisational system	Additional channels of communication and used incidentally to deal with an unusual or unforeseen situation
Configuration	Planned and created by management	Arises from the interaction of people in the organisation, and their psychological and social needs
Supporting part	Rules, procedures, prescriptions and hierarchy of authority	Norms of behaviour

Source: Skivington and Daft (1991) and Mullins (2010)

This research also investigates the formal and informal configuration of the current organisations involved in the development of water infrastructure in Metropolitan Bandung and broader settings in Indonesia. The identified configurations are focused to the problems of delay contributed by the organisational problems to come up with possible solutions to address them.

Formal Configuration of Organisational Structure

The formal configuration is the framework of an organisation with its roles and procedures, including rules, prescriptions of authority, and the hierarchy of authority (Skivington and Daft, 1991). It is created to establish relationships between individuals and groups, to provide order and systems, and to direct the efforts to achieve aims and objectives (Mullins, 2010: 7).

Schein (in Mullins, 2010: 79) underlines that a formal organisation is the planned co-ordination of the activities of a number of people for the achievement of some common, explicit purpose or goal, through division of labour and function, and through a hierarchy of authority and responsibility. As well as being planned and created, Mullins (2010) adds that formal organisational structure should be hierarchically structured with stated objectives and based on certain principles such as the specification of tasks, and defined relationships of authority and responsibility.

The formal organisation can be drawn in the form of an organisation chart, coupled with a separate description of the divisions of the functions, roles, and responsibilities for each member of the organisation (Mullins, 2010). It is not only showing the organisational structure, but the chart also to gives view on a work flow of a formal organisation.

Informal Dimension of Organisational Structure

The informal dimension of organisational structure is the pattern of interaction between the members of organisations involved (Skivington and Daft, 1991). It arises from the interaction of people working in the organisation, their psychological and social needs, and the development of groups with their own relationships and norms of behaviour (Mullins, 2010: 94).

The informal organisation can serve several important functions, as identified by Mullins (2010), which have been restructured based on their relation to this research's focus, as follows:

- It provides a means of highlighting deficiencies or weaknesses in the formal organisation – for example, areas of duties or responsibilities not covered in job descriptions, or outdated systems and procedures;
- It provides for additional channels of communication – for example, through the 'grapevine': information of importance to members is communicated quickly;

- It provides a feeling of stability and security, and through informal 'norms' of behaviour can exercise a form of control over members;
- It may also be used when formal methods would take too long, or not be appropriate, to deal with an unusual or unforeseen situation;
- It provides a means of motivation – for example, through status, social interaction, variety in routine or tedious jobs, and informal methods of work;
- It can satisfy members' social needs and give them a sense of personal identity and belonging.

3.3 Basic Framework of the Organisational Processes

This Section reviews various academic literature, best practices, and guidelines discussing the physical development processes. From a conceptual perspective, the discussions are on the Policy-Planning-Implementation Process (PPIP) formulated by Alexander (1979; 1985; and with Faludi, 1989), a model describing the link from strategy to programme and projects by Kor and Wijnen (2007), and the Production of Organisational Performance. Each of these is discussed in the following Sections.

These conceptual frameworks were completed with the review of the Planning, Programming, and Budgeting System that was initially implemented in the USA and then replicated in many other countries. It is followed by a discussion of the factors affecting the complexity of the processes, to illustrate that development processes are not linear but complex, with many dynamic relations between the related activities and organisations involved.

3.3.1 Policy-Planning-Implementation Process Model

This Section reviews Policy-Planning-Implementation Process (PPIP) Model of Alexander (1979; 1985; and with Faludi, 1989). It offers a systematic examination of deviations from the complete phases in the classical planning and decision-making process, and tries to recognise all variations and their ramifications (Alexander, 1979).

To create the PPIP model, Alexander (1979: 41–42) examined sixteen actual cases of planning and their implementation processes in the United States, UK, Brazil and Israel. These cases were diverse in terms of the scale of the institutions involved, from the neighbourhood level up to a national management system, and these cases covered both government and private sector.

As indicated by its name, the PPIP model covers the continuous processes of production from stimulus, policy making, planning and programming, to implementation. However, Alexander (1979) found that not all the cases he researched followed full phases from stimulus to implementation.

There were cases where the processes discontinued or skipped one or more stages. These variations, with their success and failure, led to seven categories of sub-models. Furthermore, this research identified that there is another possible category that can be added which has not been covered by Alexander.

It is essential for this research to review the PPIP Model and its variations because the basic PPIP model shows the main phases in physical development processes. Alexander constructed the basic model based on physical development projects and programmes, such as airport, housing, and urban development, and so on. Although the model is not elaborated in detail, especially the implementation phase, it is useful as the starting point to understand the whole development process.

The Basic Model of PPIP

Stimulus, policy, plan/programme and implementation are the key terms in this model (see Figure 3.1). Stimulus is defined as the initial event or perception which triggers further action (Alexander, 1979). Adopted from Nakamura and Smallwood (in Alexander and Faludi, 1989), a policy or plan is defined as a set of instructions that spell out goals and the means for achieving those goals. Wildavsky defines programme as a specific intervention to achieve objectives and solutions to problems (Alexander and Faludi, 1989), while implementation is the carrying out of a policy, which is usually made in a statute (Alexander, 1985: 405).

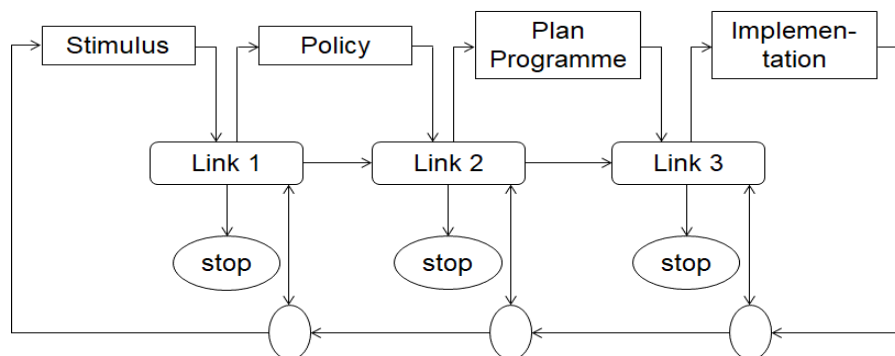


Figure 3.1 Basic Model of Policy – Plan/Programme – Implementation Process

Source: Alexander and Faludi, 1989: 132

Besides the stimulus, policy, plan/programme, and implementation, the original PPIP model shows “Link” and “Stop” to open the various paths from stimulus to implementation. Links 1, 2, and 3 indicate the need to decide whether to continue to the next phase, skip a particular phase(s), or stop the process. Its function is like the circle sign to link to the other processes or links. The stop sign means to abort or end the process after the stimulus or the other phase. Additionally, the arrows indicate continuous processes or feedbacks.

Variations in the PPIP Model

From sixteen cases, Alexander (1979: 44–46) groups the variations in the PPIP model into seven categories. Figure 3.2 shows the original model, while Figure 3.3 presents the reformed original model, with boxes in dashed lines to indicate skipped phases.

1. **The Standard “Classical” Model** (Stimulus–Policy–Plan/Programme–Implementation). This is a continuous sequential model that runs a complete course from stimulus, policy, plan/programme to implementation. It also includes feedback from the latter to the former phases. Since it runs a complete phase, it takes the longest preparation time (Figure 3.2).

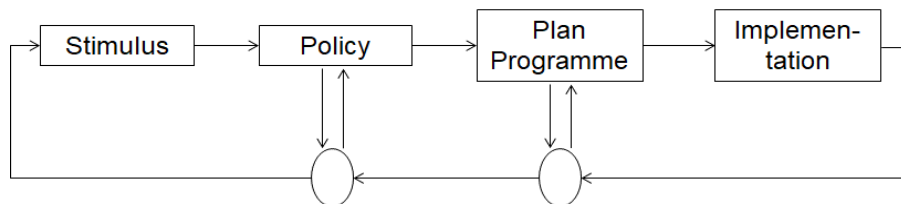


Figure 3.2 Classical PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

Alexander (1979) found that ten out of sixteen cases represented this sequence with their successes and failures. Some success stories were: the UK’s new town planning and development initiated in 1946; the idea of garden cities; and, the effort to deal with housing shortages during the 1970s. These were considered successful and perceived to be part of the national scheme. However, following the standard model did not guarantee success, as Alexander (1979) also revealed the failure of the plan to develop Brasilia as Brazil’s federal capital between 1950 and 1960.

2. **The “Invisible Hand” model** (Stimulus–Implementation). In this model, the stimulus is responded to by implementing the required action directly without prior policy making, planning or programming. The invisible hand indicates an individual or an organisation that has authority or can influence decision makers to execute a project with immediate effect. In other words, this is a non-policy driven and unplanned implementation model.

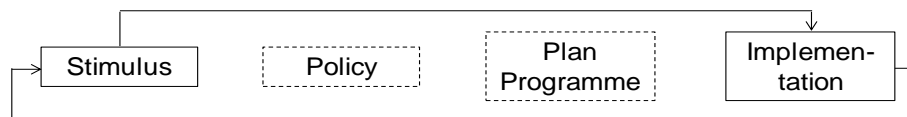


Figure 3.3 Invisible Hand of PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

Examination of this model suggests that there does not have to be a necessary connection between a social stimulus and policy making or planning to affect its implementation (Alexander, 1979: 44). Nevertheless, although due to the incompleteness of the process this model may be perceived as a non-ideal or undesirable model, it is likely to be applied in emergency situations or as a stimulus that needs an immediate response.

3. **The “Direct Planning” Model** (stimulus–plan/programme–implementation). This model is derived from other findings by Alexander (1979) from cases that skipped policy making and went directly to detail planning.

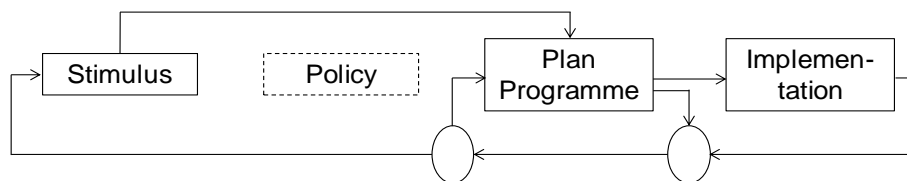


Figure 3.4 Direct Planning of PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

This model tends to be followed by a programme or project at the local level, often one that starts based on an initiative or is influenced by an exogenous stimulus (Alexander, 1979). This model may be needed for operational and maintenance purposes as a routine activity requiring less investment.

4. **The “Non-Decision” Model** (stimulus–stop). This model shows that the stimulus, for some reason or other, is diverted before it is expressed as policy.

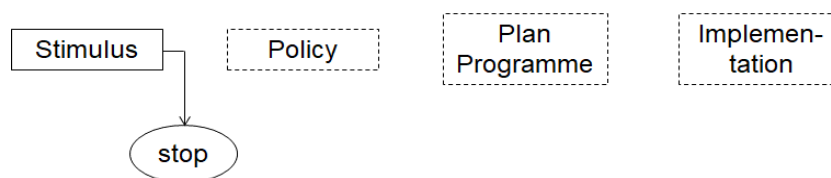


Figure 3.5 Non-Decision of the PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

One case which falls into this model is the suburbanisation programme in the United States which occurred between 1945–1960, to address post-war housing; it was not implemented due to be an uncoordinated programme (Alexander, 1979: 44). The housing needs as a stimulus are acknowledged, but there was no further preparation to implement the intended programme.

5. **“Policy Abort” Model** (stimulus–policy–stop). This is another non-implementation model, after the “non-decision”, where a policy is rejected for any further planning/programming process and its implementation.

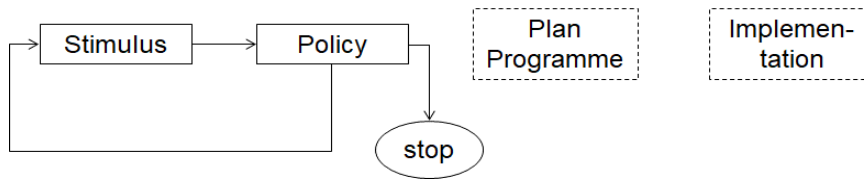


Figure 3.6 Policy Abort of the PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

Alexander (1979) believes that most initiatives are aborted in the legislative arena or abandoned in public agencies. It happens even for highly institutionalised and well-articulated policies such as Alexander’s case of the rejection of the proposed site for the 3rd London Airport by the Roskill Commission in 1968–1969. Alexander (1979) underlines that the continuity of the process is affected by the characteristics of the stimulus or the policy itself.

6. **“Policy-Plan Abort” Model** (stimulus–policy–plan/programme–stop). Just as the process can be aborted after the development of policy, so this can happen after finalising plans and programmes.

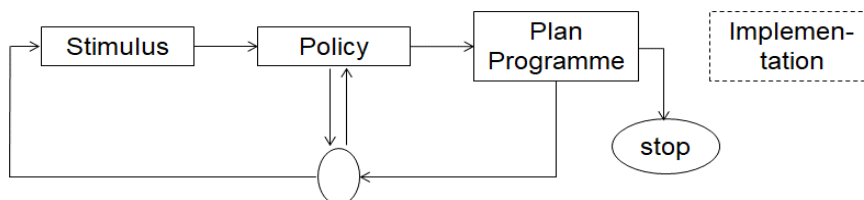


Figure 3.7 Policy-Plan Abort of the PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

This model shows that the characteristics of the projected plan or proposed programme become, alongside the complexity of other factors, potential points of failure. Alexander (1979) realised this model after studying the case of the Hook New Town Plan in the context of the British new town policy, where the plan was abandoned due to local resistance.

7. **“Direct Plan Abort” Model** (stimulus–plan/programme–stop). According to Alexander (1979), this is perhaps the most typical model of all, in which plans/programmes are aborted or never approved. In this case, the rejection may be because of the lack of support from policy analysis and the lack of resources for its implementation.

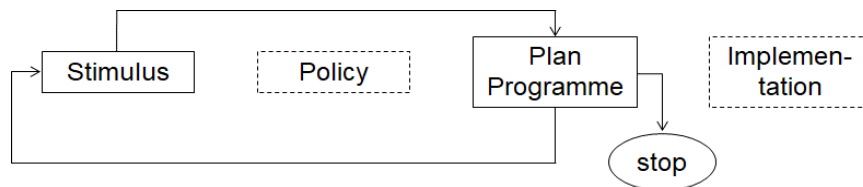


Figure 3.8 Direct Plan Abort of the PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

8. **“Direct Policy” model** (stimulus–policy–implementation). Considering the seven sub-models by Alexander, this model can be added to complement variations in PPIP mode.

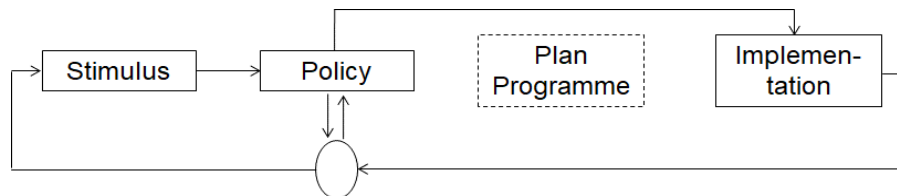


Figure 3.9 Direct Policy of the PPIP Model

Source: adapted from Alexander and Faludi, 1989: 132

This model is derived from the “Invisible Hand” model but adds the policy step before a programme/project is implemented. The existence of policy helps the implementing unit justify what they are executing.

The Use of the PPIP Model

The PPIP model and its variations has been able to offer a systematic examination of the deviations from the complete phases of development processes. The model has been beneficial for this research as the starting point in constructing a complete model to describe the whole decision-making process from the first initiation of a programme to the achievement of its outcomes.

Also, understanding the basic model and the variations in the PPIP process is useful for this research as guidance in analysing the process of the development of the regional water supply programme in Metropolitan Bandung, as the case study of this research. The programme is then compared with the models to identify which model fits the case study. This is the first step in analysing the characteristics of this programme in Indonesia, as one input in identifying problems and possible solutions for the problems within the programme.

Although the PPIP model specifies the preparation process of policy making, planning, and programming, it does not cover budgeting, and this may be identified as a vital factor in ensuring how financial resources are utilised during implementation. The PPIP model also does not clarify the implementation process of a programme, which can include project execution, monitoring, and evaluation.

Alexander (1979) discovered that progression from each stage of the PPIP is not direct but mediated by a complex set of factors which may have a substantial impact on the success or failure of the process. Therefore, the PPIP model suggests examining the phases that the programmes/projects go through, in addition to finding out whether there are any other robust factors which could influence policy analysis, the planning process, and programme design or implementation.

Success and failure stories from Alexander’s cases indicate that following more complete phases does not necessarily lead to better results and vice versa. Success depends more on how a programme or project is handled, by considering the importance of a phase that should be conducted.

3.3.2 Formulating a Strategy for Programmes and Projects

Since PPIP models lack an essential part of the implementation process, the search for other complementary models continues. DonVito (1969) suggests five primary and sequential phases that must be carried out by an organisation to deal with a programme or projects, namely planning, programming, budgeting, operations, and evaluation. For this, Kor and Wijnen (2007: 4) offer a model that encompasses all of these phases. Although the model is not described in detail in their book, it is helpful to understand the process and respective output.

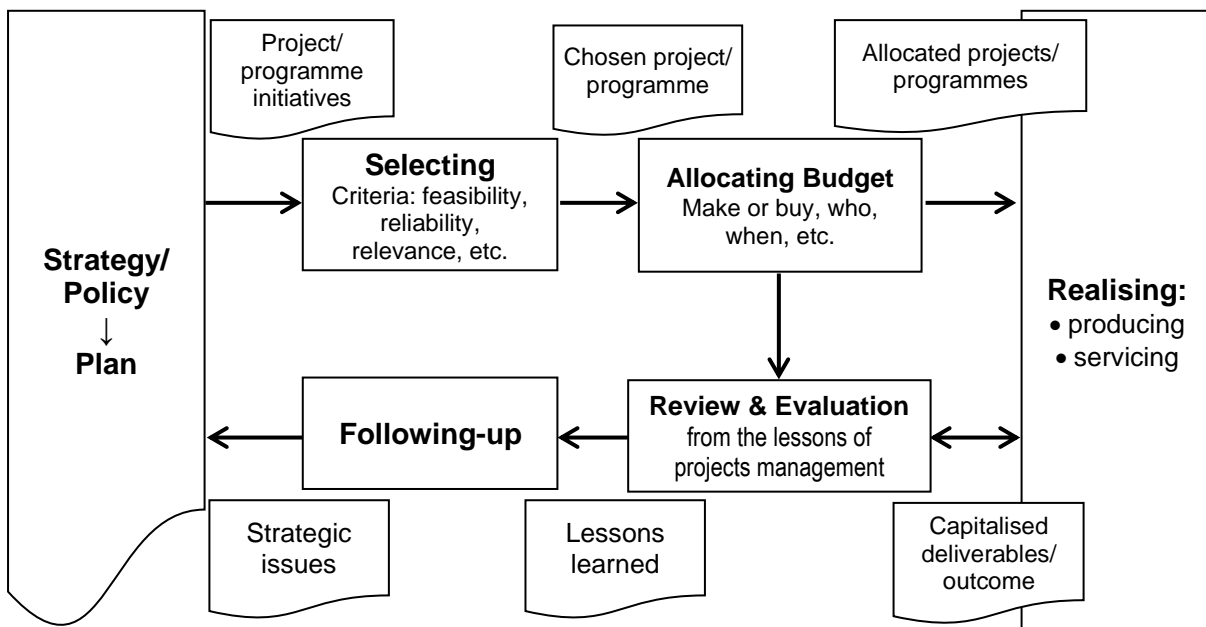


Figure 3.10 Relationship between Strategy and Projects and Programmes

Source: adapted from Kor and Wijnen, 2007: 4

Kor and Wijnen (2007) usefully allay part of the doubt of Laurian *et al.* (2004a: 471) that “none of the existing studies on implementation proposes a general methodology to systematically link plans to their outcomes”. This model was combined with the other models to arrive at a more comprehensive overview of the process from the first initiation of a programme to the achievement of its outcomes.

As shown in Figure 3.10, some parts of the original diagram have been adapted to simplify it and bring it into line with this research. Additionally, the original definitions and ideas of some phases have been adjusted, and these are described in the following discussion.

Overview of the Processes

In brief, Kor and Wijnen (2007: 4–5) begin the diagram with ideas offered by organisation strategy. These ideas cannot be immediately implemented before a plan is prepared with project/programme initiatives as part of its content. The selection of project/programme initiatives is then conducted by considering their workability, relevance, and feasibility.

After the chosen projects/programmes have been decided, the next step is to allocate a budget. Practically, selecting projects/programmes and allocating a budget are iterative processes to match the budget envelope with the need to finance projects/programmes. The implementation of projects/programmes depends on budget allocation for the respective project/programme.

The following step is to determine whether the projects and programmes will be carried out in-house or contracted out. The production of goods or service provisions during the project/programme implementation capitalise on deliverables and outcomes. To assess whether the implementation is in line with the previous policy and plan, it needs review and evaluation processes.

Review and evaluation provide lessons about how the project or programme was handled and how relevant the strategy was. Lessons learned from previous processes are expected to be considered during review and evaluation. The lessons learned are beneficial input for the follow-up process which links the implementation with the policy and plan formulation. Strategic issues should be highlighted to place focus more on strategic follow-up.

Adjustments on Definitions of Key Terms from Kor and Wijnen (2007)

In this model, the definition of planning from Kor and Wijnen (2007) is mainly concerned with planning for a project or programme. However, for this research the preferred definition of planning is related to the pursuit of the common good and making better places for the wider public (Campbell, 2012: 391; Healey, 2010). Henceforth, to differentiate them in this thesis, planning for a programme or projects will be termed 'programme or project planning'.

The process for selecting project/programme initiatives is called programming. The programme plan is used to speed up decision-making and make the organisation more efficient (Bossidy and Charan 2002). Programming involves activities that specify the programme goals and the means needed, together with carrying out the specified effort for pursuing the goals (Kor and Wijnen, 2007).

The next phase after the selection of projects/programmes is termed money management by Kor and Wijnen (2007: 102). However, considering that the main objectives of this phase are allocating budget and determining how to carry out all the programme/project activities, in this research it is named the budgeting phase. This is because money management is more about estimating the total expenditures and revenues and detailing them, rather than ensuring budget allocation as the primary purpose of the budgeting process.

With programming as the bridge, the relation between budgeting and programme planning is not only determining which programmes/projects are to be funded, but also where an indicative budget allocation influences the initiation and selection of programmes and projects. In short, planning-programming-budgeting is an iterative process.

Implementing the programme/project is the next phase after budgeting and is called programme/project execution. It is conducted by producing and servicing deliverables or output. Kor and Wijnen (2007: 187) define deliverable as a tangible or intangible verifiable object that must be produced to complete a project. Afterwards, outcomes are achieved as the impact on, or consequences for, the community from the outputs (Kristensen *et al.*, 2002: 10). This lies in the assumption that the programme and project execution is fully funded.

The terms programme and output are not interchangeable. Projects are part of a programme. Projects produce outputs, while programmes capitalise outcomes (Sowden, 2011). For instance, in the water supply sector, one outcome indicator is the

amount of treated water produced, which is firstly achieved by running the projects that produce the related outputs. These outputs can be in the form of untreated water intake unit, water treatment plant, and pipeline network. In order to achieve outcomes, outputs should be established and functioning.

As a term adapted from Kor and Wijnen (2007), a review has two aims: firstly, to bring everyone up-to-date on the latest developments of the reviewee and, secondly, to involve everyone in the decision-making process about the reviewee's future. Regarding evaluation, the European Commission's (1997a) definition is activities which judge a project or programme critically and systematically, in terms of what went well, what could have been better, what has to be done differently, and so on.

On completion, an evaluation is needed to determine the lessons learned from what has been accomplished or an on-going programme/project. Lessons learned from review and evaluation can provide valuable feedback for later follow-up. Feedback, as adapted from Kor and Wijnen (2007: 188), is an opinion on how individual performance is experienced by the evaluator and given to the organisation displaying the performance. Furthermore, strategic issues raised by the feedback should be treated as input for the next phase of programme/project planning.

This review of the whole process from planning to outcomes, and vice versa, should recognise that all phases are interdependent. This is also true for phases not directly connected, or which are separated by other phases in between, for example, programme/project planning and evaluation, where planning should pay attention to the lessons learned brought from evaluation and, the other way around, evaluation should utilise project/programme plan as the baseline.

In summary, this model from Kor and Wijnen (2007: 4) is used to describe the whole process from strategy to the achievement of outcomes. It elaborates the implementation phase in more detail, including the phases of programming, budgeting, producing or servicing, review, and evaluation, which are not covered in the PPIP model discussed earlier.

However, the model from Kor and Wijnen (2007) lacks the needs or other stimuli as the triggers of policy and further processes until its implementation. Accordingly, this research needed to include a model of organisational performance to complement the two previous models.

3.3.3 Production of Organisational Performance

As the research focuses on outcomes as a performance indicator, understanding performance terms and the production of performance is essential. It is important to distinguish terms that are understood differently yet somehow still used interchangeably in daily situations, such as the use of ‘output’ and ‘outcome’. The following model of performance production distinguishes these terms.

The model is constructed by consolidating similar models offered by Van Dooren *et al.* (2010: 21), Bouckaert and Halligan (2008: 16), and the European Commission (1997a: 25). It is also complemented by the concepts of the relationship between output and outcome from Sowden (2011) and Mullins (2010). A detailed justification of the adjustments made to the original models is elaborated in the following discussion.

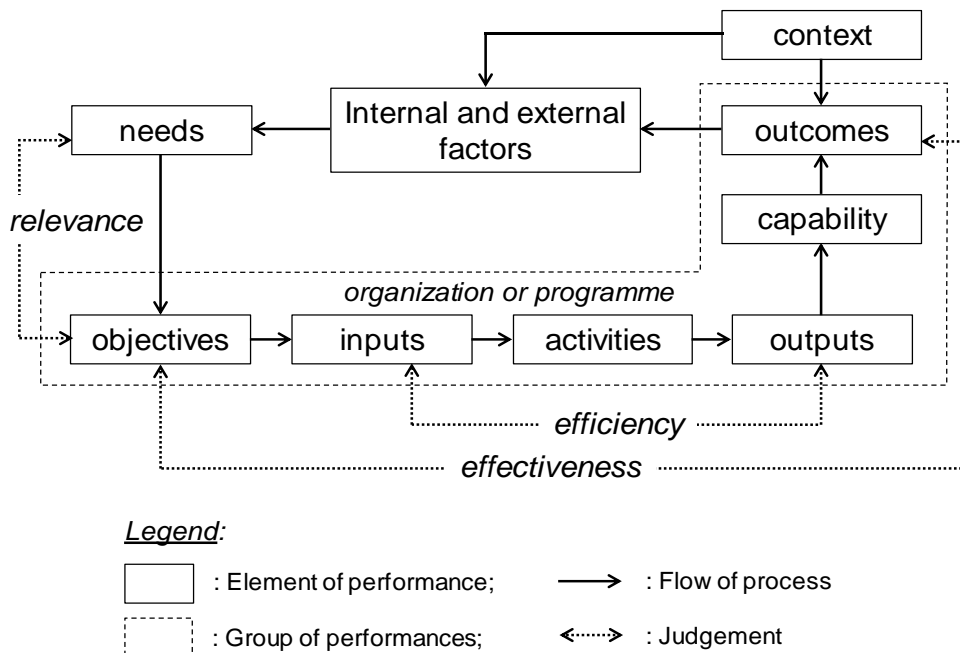


Figure 3.11 Model of Organisational Performance Production

Source: superimposed from Van Dooren *et al.* (2010: 21), Bouckaert and Halligan (2008: 16), the European Commission (1997a: 25), and Sowden (2011)

The model in Figure 3.11 can be briefly explained as follows. It starts by highlighting the importance of the internal and external situations which affect the needs and induce actions by an organisation. The needs are then translated into the objectives of the organisation or programme. Within the programme, inputs processes are resulting in activities, which then result in outputs, capability, and outcomes. Besides these internal organisational factors, the broader context and external factors which might affect the attainment of outcomes are acknowledged.

Internal and External Environment and Needs

Needs are the factor that directly induces an action by an organisation and are triggered by a particular situation. As the trigger of needs, in their respective model, Van Dooren *et al.* (2010: 21) and the European Commission (1997a: 25) offer the term “socio-economic situation”, while Bouckaert and Halligan (2008) use the term “environment” to refer to the broader context, and particularly situate the triggering need in a political context.

Both arguments are specific to their respective purposes. Accordingly, it is necessary to find more general terms which fall into “internal and external factors”, which is also suggested by Sowden (2011: 7). It is more or less similar to the PPIP model which uses the term ‘stimulus’ as the trigger for policy making, planning, and implementation.

The European Commission (1997a) defines needs as the socio-economic problems which the programme seeks to address. Furthermore, Bouckaert and Halligan (2008) observe that these needs are derived from an environment which is also affected by the achieved outcomes from previous actions. In addition, Van Dooren *et al.* (2010) suggest that there are contextual factors from a broader environment that can encompass the socio-economic situation. This external factor, as they suggest, can be in the form of policy measures from other governments.

Van Dooren *et al.* (2010) emphasise that “needs” should be carefully tailored towards the real needs of users. These identified needs should be in a form that includes information from its particular target population(s), i.e. its intended beneficiaries—individuals, households, groups, or firms (European Commission, 1997a). Failing to accurately identify the needs lead to the improper formulation of the objectives of a programme.

Both internal and external factors and needs are incorporated in the amalgamated model (Figure 3.11), which shows the development processes of physical infrastructure. Additionally, in relation to the research case of the development of regional water supply infrastructure, understanding and separating the internal from the external factors affecting the programme is essential to structure the research analysis, to arrive at the most effective solutions to the problem addressed in this research.

Objectives and Relevance

As shown in the organisational performance production model (Figure 3.11), objectives have a clear and direct relation to needs, and there is no difference between the three original models. Bouckaert and Halligan (2008) emphasise that needs result in objectives that are realised through outcomes, and therefore objectives should represent what is needed by the intended beneficiaries.

The conflict between objectives and needs requires the assessment of “relevance” (Van Dooren *et al.*, 2010), which can be defined as the extent to which a programme’s objectives are pertinent to evolving needs and priorities (European Commission, 1997a). The importance of the relevance criterion is that it can lead to decisions about whether a programme should be allowed to continue in its current state, or whether it should be altered significantly, or merely allowed to lapse without being renewed (European Commission, 1997a).

Sowden (2011) believes that continuous benefit is one of the most important measures of the success of a programme, and therefore being consistent with an orientation to fulfil needs is vital, not only during the formulation of objectives or in the other preparation stages, but also for the further process until the realisation of outcomes.

In order to judge the performance of a programme, including the relevance, a clear indication (characteristics or attributes) of the objectives is crucial. The European Commission (1997a) suggests breaking down the objectives into at least operational objectives (expressed in terms of outputs), and general objectives (expressed in terms of outcomes). Objectives should be able to set out the specific goals of the organisation, the aims to be achieved, and the desired end results with a strong sense of purpose and actions for its implementation (Mullins, 2010).

Although objectives and relevance are not implicitly incorporated in the broader model of physical infrastructure development processes, these should be understood because both aspects are substantially included within each process. Moreover, understanding the concepts of relevance by objectives is essential for review and evaluation as part of the development process.

Input, Activities, and Output

In order to meet the objectives, inputs are utilised for the programme and allocated to various programme activities as an element of the work performed during the run of a

programme (Van Dooren *et al.*, 2010 and Kor and Wijnen, 2007). This process leads to the generation of goods and services by the programme or projects as part of the programme, which are its outputs (European Commission, 1997a: 22).

Although simplistic, the transformation from inputs to outputs is essential in terms of understanding it is a common feature in any type or classification of organisations (Mullins, 2010). It can also be seen from the same conception of the three original models by Van Dooren *et al.* (2010: 21), Bouckaert and Halligan (2008: 16), and the European Commission (1997a: 25).

In practice, particularly in the public sector, the links between input, activities, and outputs are much more complex and littered with disconnections, disruptions and disjunctions (Bouckaert and Halligan, 2008). In order to achieve the objectives, organisations can take inputs from the other systems and through a series of activities transform or convert these inputs into outputs that can be utilised for other systems (Mullins, 2010).

Complexity might originate from any side, either inputs, activities, or outputs. From the input side, changes in the environment will affect them, and changes in inputs will affect the transformation or conversion process, and hence the outputs (Mullins, 2010). The nature and scale of the series of activities most likely varies from one organisation to another in terms of the interrelationships between technology, structure, methods of operation, and the nature of environmental influences (Mullins, 2010). Therefore, clear objectives are needed to determine the nature of inputs and the series of activities to achieve outputs (Mullins, 2010).

Outputs are sometimes directly consumable, such as the volume of water produced daily (Vilanova *et al.*, 2015). However, in many cases it is just the degree of availability which means that sometimes intermediate outputs are connected to the logical level of activities, sometimes even for the next generation, or are undividable (Bouckaert and Halligan, 2008). An example of intermediate output in the water supply sector is the volume of water taken from water sources, the treated water that has not been distributed, or the volume of water in storage as a reserve.

Outputs, Capability, and Outcomes

“Output does not acquire meaning until it is related to the outcomes” (De Bruijn, 2002: 17). Outcomes, intended or unintended, gross or net, are everything beyond outputs

as a basic and primary criterion in assessing public sector performance (Bouckaert and Halligan, 2008).

Public administration literature separates types of outcome as intermediate (usually but not always in the short term) or final (usually but not always in the long term) (Van Dooren *et al.*, 2010). As seen in Figure 3.11, outcomes, final ones in particular, are influenced by the context in which the organisation or programme has a limited or no impact. The type and level of outcome is affected by the environment, which should also be affected by these very outcomes (Bouckaert and Halligan, 2008).

The most reasonable description regarding the relations between the outputs and outcomes of a programme or organisation is offered by Sowden (2011). He introduces the “capability” that should exist between outputs and outcomes. Capability, according to Sowden (2011: 79) refers to the complete set of project outputs that are required to deliver an outcome. This should exist before the transition to a new service, function or operation that enables the organisation to exploit opportunities.

In other words, the capability is an answer to the question of ‘what will we need to have in place to enable the new operating state?’ (Sowden, 2011). It emphasises that achieving the desired outcomes requires not only that all the outputs from the main projects should be completed, but also that the supporting unit/organisation, personnel, or system that should be established beforehand.

Thus, Sowden (2011: 79 and 285) defines outcomes as a new operational state achieved after the transition of the capability into live operations due to the activities undertaken to effect the change. This definition implies that it is possible to find a disconnection between outputs and outcomes. Bouckaert and Halligan (2008) argue that the disconnection can be caused for a variety of reasons, such as politicians who over or under grade outcomes, and citizens who inhibit the full attainment of outcomes because of their reactions.

Nonetheless, the outcomes of a programme or organisation have to address the needs of society (Van Dooren *et al.*, 2010: 24). Referring to Figure 3.11, this means two things. Firstly, it should be confirmed that the needs are represented in the formulation of objectives, which can be assessed by their relevance. Secondly, it should be ensured that the execution of a programme and its related projects is consistent with the desired objective.

The following are examples of output, capacity, and outcome for the case of water infrastructure development. An example of output might be the form of a constructed untreated water intake unit, water treatment plant, or pipeline network, and so on. Outcomes would not be achieved before all the elements of the system are integrated and have the capacity to deliver water. When the system is functioning, the amount of water produced is the outcome of the infrastructure system.

Effectiveness and Efficiency

There are different ways of defining effectiveness. Mullins (2010: 776) sees effectiveness as the ratio of outputs related to some specific purpose, objective or task, while the European Commission (1997a) defines it as how far the programme impacts (results and outcomes) contribute to achieving its objectives. However, Van Dooren *et al.* (2010) define effectiveness as the ratio of output over outcome, and the ratio of input over outcome is cost effectiveness.

The definition of effectiveness from the European Commission (1997a) is more reasonable for this research, because the main focus is on the outcome. Therefore the focus on ratios proposed by Mullins (2010) is not very useful. Similarly, the definition of Van Dooren *et al.* (2010) is also not preferable because it does not relate effectiveness with objectives as the benchmark of a programme or organisation. Thus, the term effectiveness in this research is defined as how far the programme outcomes contribute to achieving related objectives.

Efficiency is defined as how economically the various inputs have been converted into outputs (European Commission, 1997a). This definition is in line with Mullins' (2010) definition, in which organisations need to be efficient in the sense of the optimum use of their resources and the ratio of output to input. Van Dooren *et al.* (2010: 21) also support this definition by stating that the ratio of the input over the output is efficiency.

Bouckaert and Halligan (2008) believe that outcomes or effects and the related effectiveness ratio are the ultimate purpose of public sector intervention. They suggest placing effectiveness as the primary dimension of performance, while efficiency or productivity is a secondary dimension. This is due to the likelihood of an organisation or policy being effective but also inefficient, which they see as not optimal. Moreover, inefficiency will be the secondary issue to assess when an organisation cannot achieve its objective or is ineffective.

Although effectiveness and efficiency are not incorporated in the big model of the physical infrastructure development process, they remain crucial as terms in this research. This is because they are used to analyse how the development of regional water supply infrastructure in Metropolitan Bandung, as the case study, reached the intended objectives, and whether it has been conducted efficiently in terms of time, coordination, and other related aspects.

3.3.4 Planning, Programming, and Budgeting System

The previously discussed models should have been sufficient to construct a model describing the physical infrastructure processes. However, the following discussion on the Planning, Programming, and Budgeting System (PPBS) implemented in many countries is worth considering ascertaining how such long development processes have been implemented in the real world.

PPBS is a stimulating development approach to study since it brings spatial and development planning, programming, and budgeting together in an integrated system. Within parts of the policy research community and government actors, PPBS has been perceived as the basis for rational planning and decision-making (Jann and Wegrich, 2007).

The following discussion on PPBS commences with the purpose and process of PPBS and its supporting elements. This is followed by a critique and evidence of the implementation of PPBS in the USA and other countries. Lessons from this experience, particularly from the determinants of the failure and success of the implementation of PPBS, were essential in the formulation of the variables of this research. This discussion will ensure that solution to the problems within the development of regional water supply in Indonesia is more convincing, as best practice from the application of PPBS abroad can be adapted and utilised in the Indonesian context. Moreover, PPBS is in line with the development of the planning and budgeting system which was started in 2003/2004 with the establishment of the new planning and budgeting laws.

Purposes and Benefits of PPBS

DonVito (1969), from the RAND (Research and Development) Corporation and the creator of PPBS in the USA, states that the primary objective of PPBS is to unify planning, programming and budgeting functions to achieve a better analytical basis for making programme decisions, and for putting such decisions into operation. PPBS

sought to accomplish this through an elaborate process that linked planning with budgeting by objectively evaluating and comparing the activities of organisational units in terms of the purposes they serve (West, 2011).

PPBS generally includes five critical components (Frank, 1973: 528): (1) a focus on government objectives; (2) the consideration of full systems costs (capital, current, multiyear, and indirect or induced); (3) the identification of alternatives for achieving goals; (4) the measurement of benefits or the effectiveness of alternate schemes to achieve these goals; and, (5) the comprehensive presentation of data for inclusion in budgetary decision processes.

In about a decade, Canada gained the benefits of its early experiences in implementing PPBS, which Balls (1970) specifies as follows:

- Improved the top level political decision-making process by clarifying governmental and departmental objectives, by emphasising the identification and analysis of alternatives in selecting goals and objectives, by facilitating comparison of specific courses of action, and the making of priority choices in the development of objectives by focusing attention on significant policy and programme issues;
- Better orientation of the Treasury Board from an agency primarily concerned with keeping the lid on expenditures through highly centralised and detailed control mechanisms, to a forward-looking planning body which promotes the effectiveness of departmental programmes through expert analysis of expenditure proposals in terms of both possible alternatives and the objectives of the government;
- Improved departmental decision-making by facilitating the development of programmes and activities to attain agreed objectives;
- Improved responsiveness of the governmental financial machine to political decisions by relating expenditure more clearly to policy objectives;
- Improved managerial decision-making by establishing criteria or measures of performance by which the cost effectiveness of programmes and activities can be measured;
- Improved managerial control by establishing a framework where the objectives and activities of individual departments can be planned, co-ordinated and controlled;
- Increased awareness of, and willingness to use, available economic analysis, evaluation, decision-making and management techniques;
- Promotion of the development of better information systems and facilitation of a more rigorous, analytical study of a vast quantity of data;

- Greater awareness of the inter-relationship of all areas of government activities and the fact that decisions in one sphere may have significant implications for activities in others;
- Continued questioning of the validity of objectives and the capacity of the approved programmes and activities to achieve those objectives.

The approaches and purposes of PPBS as seen above are thus useful to adopt as the vision of the new system built to tackle the problems within the development of the regional water supply infrastructure in Indonesia. Moreover, the real benefits from the integration of planning, programming, and budgeting as discussed above show that it is not only theoretical but likely to be achievable.

Phases in PPBS

In brief, DonVito (1969) describes the process of PPBS as follows. Planning in the form of spatial or development planning is conducted through analysis and research, and becomes in PPBS part of the process of programme formulation. Planning research to select particular courses of action provides the basis for the organisation’s overall programme. Also, the annual budget is derived directly from the organisation’s approved programme and financial plan. Planning, programming and budgeting, although each a specialised exercising function, become separate phases of a single effort, which is to set the course for the organisation.

Although each phase takes about a year, they can overlap and so for programmes executed in 2017, the planning phase would have begun at the end of 2013 and been followed by programming in 2014, with the budgeting process one year ahead of the execution (Martin *et al.*, 2016). Table 3.3 illustrates how planning, programming, budgeting, and execution take place on a monthly basis.

Table 3.3 Timeline of Planning, Programming, Budgeting, and Execution in the United States Department of Defence

2013			2014					2015					2016					2017													
S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D				
				Planning																											
							Programming																								
												Budgeting (FY 2017 President’s Budget)																			
																					Execution (FY 2017)										

Source: Martin *et al.* (2016: 9)

Planning in PPBS

Planning, as the initial step in PPBS, is an analytical activity carried out to aid in the selection of an organisation's objectives and then to examine courses of action that could be taken in the pursuit of objectives through a systematic consideration of alternatives, using various techniques including that which is known as systems analysis (DonVito, 1969; Balls, 1970; and Rosef, 1970). In planning, this means the establishment of clearly defined goals, and output targets within the budget statement (Jann and Wegrich, 2007).

In the planning phase, capability needs, gaps, and possibly excesses will be identified and assigned a degree of risk associated with the projected consequences of each shortfall (Martin *et al.*, 2016). In effect, this poses the question as to whether some particular course of action would contribute more to the attainment of the organisation's goal than its various alternatives (DonVito, 1969).

Looking at the description above, for the case study planning in PPBS can be adapted by emphasising the orientation of planning in this research towards making better places for the wider public (Campbell, 2012; Healey, 2010). Using this approach is likely to ensure that planning can be utilised for programming as well. Planning can be a part of the programme formulation process to select particular courses of action that provide the basis for the organisation's overall programme (DonVito, 1969).

Programming in PPBS

In PPBS language, a programme is a package which encompasses all of an agency's efforts to achieve a particular objective or set of allied objectives (Greenhouse, 1966). This definition is similar to that preferred for this research, where the programme is defined as a group of projects managed in a coordinated way to gain benefits that would not be possible were the projects to be managed independently (Ferns, 1991: 149). The activities in the formulation of a programme are programming.

In a more extensive way, programming is defined as the function that converts plans into a specific action schedule for the organisation, consisting of developing detailed resource requirements and the actions needed to implement plans (DonVito, 1969). This is the organisation of activities related to main objectives, and their presence in the form of a programme and financial plan, including a further detailed analysis of alternatives within the context of significant policy decisions, and the regular review of programmes as a whole (Rosef, 1970).

More specifically, Balls (1970) describes programming in PPBS as the phase in which to devise the means to achieve the objectives and arrive at a more specific determination of the workforce, materials, facilities and funds necessary for carrying out agreed programmes. Considering that the situation is likely to be dynamic after the planning process, this is the balancing and correction of shortfalls given available resources (Martin *et al.*, 2016). During the programming phase, overall priorities are decided, reviews are called for, new projects set underway, and provision made for additional staff to extend services (Rosef, 1970).

Budgeting in PPBS

Under PPBS, with the primary objective of unifying planning, programming and budgeting, autonomy in each phase is meant to be minimised (DonVito, 1969), and this also applies to the budgeting process. The function of the programme budget is to link the substantive planning of the organisation with fiscal and long-range planning, with its multi-year and annual budget; it also projects all the resource and money requirements for carrying out the organisation's programmes (Hitch, 1968).

Budgeting in PPBS is concerned with securing sufficient funds to put the programme into operation (DonVito, 1969). It is the translation of the programme and financial plan to a more detailed and precise annual budget, to set targets for performance, fix limits for spending, and forecast income to be received (Rosef, 1970). It also includes the processes of transforming long-range programmes into the terms of a periodic fiscal budget, by laying down a detailed budget and the financial implications of the programmes and activities (Balls, 1970).

The idea of budgeting in PPBS is contradictory and largely understood as the goal of budgeting, as indicated by West (2011), and is a matter of allocating fixed shares of the pie as established through precedent rather than an analysis of where money could be spent most effectively. The annual budget in PPBS is derived directly from the organisation's approved programme and financial plan (DonVito, 1969).

Budgets in PPBS reflect the more precise amount of funding available for operations, procurement, personnel support, and all the other activities (Martin *et al.*, 2016), and thus they are more precise than plans and programmes, especially in the budget year.

Execution and Evaluation in PPBS

The original PPBS used the term operation to define the actual carrying out of the organisation's programme (DonVito, 1969). However, at least at present in the US, for the PPBS of Department of Defence (DoD), the term 'operation' has been replaced with 'execution', which even led to a change in the abbreviation from PPBS to PPBE (Planning, Programming, Budgeting and Execution (see Martin *et al.*, 2016). Therefore, this research preferred to use the term 'execution' since it is the actual term used in practice at present, but retain the use of PPBS because more extensive discussion in the literature uses this managerial system.

While budgeting is generally associated with the preparation and presentation of a budget, execution deals with the actual allocation and expenditure of funds (Martin *et al.*, 2016), and is the object of the other phases (DonVito, 1969). Therefore, actors in other parts of the processes should be mindful of the potential problems occurring during the execution phase. For example, abrupt changes in the near-term programme profile may induce uncertainty and forced inefficiency in spending. It is also essential to ensure that items appearing in programming and budgeting documents are consistent so that no mixed messages are transmitted to internal or external addressees (Martin *et al.*, 2016).

Execution is closely related to evaluation, which was defined earlier as the function to measure and appraise the worth of programmes in attaining goals, as the basis to modify an on-going programme execution if indicated, or in planning future programmes (DonVito, 1969). This definition suggests that evaluation in PPBS also has the function of monitoring current activities.

Critiques over PPBS

Although when PPBS was first introduced in US civil agencies in 1965 it was expected to be a breakthrough in the decision-making process (Botner, 1970), it unfortunately had little impact and was formally abandoned in 1971 (West, 2011). However, it remains working in the US DoD at present (see Martin *et al.*, 2016).

West (2011) highlights various factors affecting the failure of PPBS in civil agencies. These include a reduced amount of required work, organisational inertia, inadequate resources, resistance by entrenched political interests, and the limitation of the assumption that the relationships between organisational means and ends could be explicitly specified and measured. The other potential factors are intergovernmental relations (Mosher, 1969) and leadership (Bottner, 1970).

The amount of work required, mainly for qualitative analysis requirements, has been vocally criticised (West, 2011; Yang, 2007; and Mosher, 1969). Yang (2007) discovered that PPBS required a substantial amount of quantitative analysis, such as cost benefit analysis, operations and systems research, and linear programming. Furthermore, all US federal departments and agencies were required to establish central analytic offices. They also mandated impact analysis in environmental policymaking.

The requirement for quantification brought problems when arranging a programme with no specific physical product (Mosher, 1969). Furthermore, these quantitative techniques failed to effectively deal with many complex social problems because these cannot be represented with a rational scientific model and do not have a single unitary goal (Yang, 2007).

Mosher (1969) discovered that PPBS lays heavy emphasis on quantitative measurement, but insufficient analytical capacity became an issue in PPBS in the US. This led to problems in providing a meaningful programme structure for all the activities, to explore causality, and to develop a sensible weighting scheme (Van Dooren *et al.*, 2010). Bureaucratic inertia, the lack of expertise and other resources required, as well as inadequate leadership and technical guidance, were suspected as the other causes (West, 2011).

PPBS was also indicated to be incompatible with the legislative body and its complex and political decision-making environments (West, 2011). Mosher (1969) discovered that PPBS in the US was not received very enthusiastically by Congress (Mosher, 1969). Additionally, Jann and Wegrich (2007) highlight the other reason why, based on criticism from Wildavsky, concepts in PPBS were considered too technocratic at the beginning of decision-making. This was due to conflict between analysis by analysts, and value judgements by politicians (Van Dooren *et al.*, 2010)

A more challenging situation in which to implement PPBS is when more than one level of government is involved in a programme. In such cases, the correct system approach is required because the objectives of each level are at least roughly related to those of other levels, and the outputs of programmes are measured against the inputs of all levels, rather than in and of themselves (Mosher, 1969). This complexity also means more complex budgeting and execution.

Canada, about a decade after applying PPBS, faced certain problems in implementing PPBS. In Balls' list (1970: 302-303), the foremost of these is the difficulty of applying different techniques for different programme characteristics. Others were integrating PPBS and the traditional budget structures and procedures, and the related difficulty of producing meaningful long-range planning with estimates, as the basis for planning and programming, rather than as the result of the planning process. Another problem is the difficulty in using systems analysis and applying cost benefit techniques that demand great technical knowledge and ability.

Nevertheless, PPBS is useful to study because substantially it encourages integration into a single system with many real and achievable benefits. The criticisms of PPBS, especially of complex technical issues, are also beneficial to study so that these issues can be avoided or tackled properly when a similar system is built.

Replicating PPBS

Although PPBS has been under criticism in many publications, West (2011) believes that PPBS is relevant today if for no other reason than its survival at the US DoD and its replication at the US National Oceanic and Atmospheric Administration, as well as in other countries. Therefore, the concerns and strengths of PPBS in integrating planning, programming, and budgeting should be studied to obtain its benefits, especially for those willing to replicate it in a respective organisational unit.

Additionally, Van Dooren, *et al.* (2010) observe that the French PPBS variant, RCB (*rationalization des Choix budgétaires*), was first applied in 1968 in the Ministry of Defence and replicated in the sectors of energy, town planning, postal services and telegraph; it has become an integral tool for national economic planning. PPBS practices were also implemented in, amongst other places, Australia, Austria, Belgium, Canada, Ireland and Japan (Novick, 1973), and were judged to be a success in the British Ministry of Defence, where it is still in use today (McAffery and Jones in Van Dooren *et al.*, 2010).

West (2011) revealed the reasons why programme budgeting has survived at the DoD for almost fifty years. Firstly, the DoD's mission is compatible with the hierarchical logic of PPB, especially with the multiyear planning orientation in the US DoD. Secondly, PPBS has become part of the DoD's culture and has generated its own set of institutional stakeholders. Thirdly, although PPBS requires a great deal of time and effort, the resources it consumes are a minuscule portion of the defence budget.

These reasons are closely related with the organisational culture developed in the DoD institution. In relation to Handy's four types of organisational culture, (in Mullins, 2010: 740), the first reason is due to strong planning related to the role of culture, which is often stereotyped as bureaucracy and works by logic and rationality. The second reason is due to the strength of the set of institutional stakeholders, and refers to their task culture and orientation to job or project-oriented culture. The third reason is closely related to the role of culture in terms of the strengths of organisational pillars such as finance.

Transfer to other organisations, however, is problematic, primarily due to the required system thinking for an extensive scheme and its management support (Van Dooren *et al.*, 2010), for instance in the production of information, whether for analysis or programme reporting, which should, therefore, be viewed in terms of the system as a whole (Rosef, 1970).

Furthermore, the other challenge in replicating PPBS is the requirement of programming as its heart, and this is what distinguishes it from other approaches to budgeting and decision making more generally (West, 2011). Rosef (1970) sees that providing a framework to more closely align the origination of plans and the preparation of budgets, by strengthening the programming process, is more important than improving mathematically-based techniques which have been widely criticised. These challenges in replicating PPBS will be considered when developing a new system for the case study on the development of water supply infrastructure in Indonesia. It is useful to study as input to prepare the prerequisites before making the decision to implement a similar system.

3.4 Amalgamated Framework of Organisational Processes

The previous discussion in this chapter has provided a series of basic models that reflect on different aspects of organisational processes, with their strengths and weaknesses. These original models have been consolidated to arrive at a more integrated framework to show the complete organisational process for the development of physical infrastructure (Figure 3.12).

3.4.1 *The Consolidated Framework*

The following consolidated framework was constructed by combining Alexander's PPIP Model (1979; 1985; and with Faludi, 1989), the model from Kor and Wijnen (2007), the Model of Organisational Performance, and complemented with the elaboration of Planning, Programming, and Budgeting from DonVito (1969). However, the new model (see Figure 3.12 below) is not only the result of a copy-paste consolidation, as adjustments are needed to make it clearer and more logical; this is discussed throughout this Section.

The term 'stimulus' in this amalgamated model is the result of a combination of two original models. Stimulus is defined by Alexander (1979) as an initial event or perception which triggers further action. Also, van Dooren *et al.* (2010) also include 'stimulus', this reflects a more specific use linked to the socio-economic situation as the determinant of needs. At any rate, both authors have the same understanding of the term as being the driver or trigger of policy or plan making and its implementation. Therefore, the combination of stimulus, as seen in Figure 3.12, becomes a group of interactions between socio-economic situations that lead to the needs.

Another adjustment has also been made to planning and programming, which in Alexander's model (1979) are regarded as the same entity; in this research framework, however, these are separated as they have different natures, scopes, and activities. The role of planning in this thesis is to aid the selection of an organisation's objectives and then examine courses of action that could be taken in the pursuit of objectives, while programming has the function of converting plans into a specific action schedule for the organisation (DonVito, 1969).

This adjustment was also made by referring to discussions of PPBS. Programming and budgeting, which have the most intensive iteration process, are placed together in one group and linked with a two-way arrow. This suggests that other processes that have a connection to programming should involve or inform the institution that deals with budgeting and vice versa.

As discussed in the previous section, Alexander's model (1979) does not specify the implementation process in detail. Thus, the breakdown of the implementation process uses Kor and Wijnen's (2007) model, which consists of budgeting and project execution. Monitoring, evaluation and feedback as also suggested by Kor and Wijnen (2007) are included in the framework, and thus the flow of processes, which adopted much from Alexander's model (1979), is also adjusted.

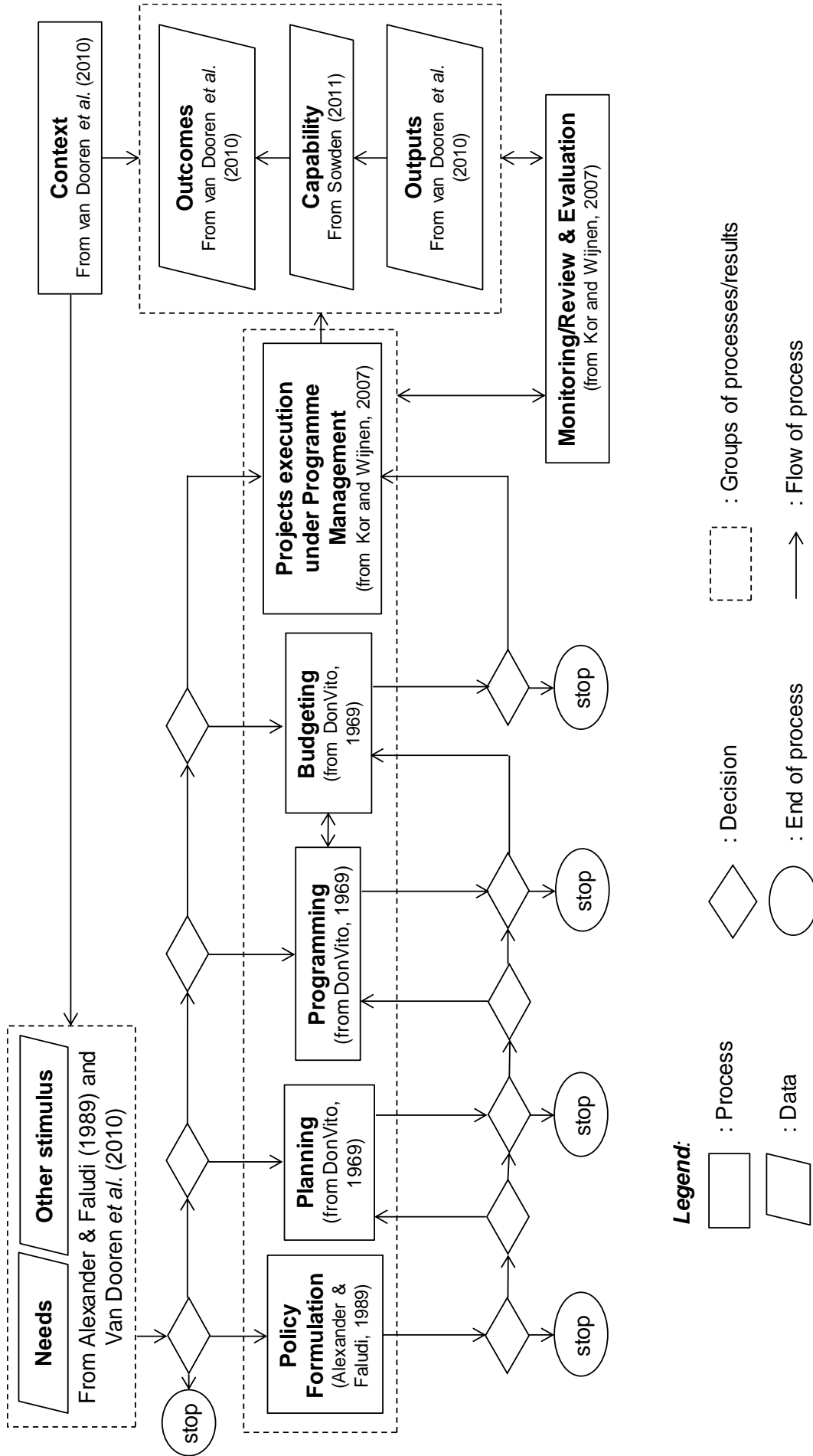


Figure 3.12 Organisational Processes of Physical Infrastructure Development

The clearer distinction between output and outcome is provided in this framework adapted from the production model of performance by van Dooren *et al.* (2010). Sowden (2011) defines output as the deliverable developed by a project, while the outcome is a new operational state after a set of project outputs are completed. In the case of water supply, pipelines are the output but never produce outcomes until the system is connected and the treated water is channelled to the consumer.

The other emphasis in this model is the role of review/monitoring and evaluation. This part has connections to all the other processes so that an immediate response can be made when the process is not running correctly. Monitoring and evaluation also deal with activities in the field, namely the accomplishment of the outputs, ensuring capability, and the achievement of outcomes.

3.4.2 The Flow of the Framework

The starting point from which to read the framework is the group of needs and another stimulus as the trigger for further actions. The needs and other stimuli are separated to emphasise the real 'needs' that should be paid attention to before other stimuli, such as political influences. Referring to Alexander's PPIP model (1979), the stimulus can be disregarded or aborted without any of the following actions, proceed as input for policy/strategy formulation, go directly to planning, programming and budgeting, or project execution.

After considering the stimuli and feedback from the monitoring and evaluation process, policy and strategy are formulated. The classical PPIP model suggests that policy/strategy will be the input for the planning process, and followed by the implementation phases. However, when the policy is not convincing enough, this can also be aborted without any further follow-up to the planning process and its implementation. A failure to implement policy should be evaluated to find weaknesses; unimplemented policies can then be considered in the next period.

The planning process for spatial and development planning might have input directly from the stimulus or formulated policy and other feedback. As is the case with policy, the plan can be aborted before being implemented. Otherwise, the plan will be considered in the programming and budgeting process. The planning process and its plan, especially aborted ones, should be reviewed and evaluated whether it is related to the quality of planning products or other factors (Carmona and Sieh, 2004).

After the planning phase, programming and budgeting are the intermediate phases in implementing programmes and projects. The role of programming is to develop detailed resource requirements and the action needed to implement plans, while the budgeting process is to secure sufficient funds to put the programme into operation (DonVito, 1969). The result of the programming and budgeting process is an allocated budget for the execution of programmes and projects, or a list of programmes and projects that cannot be funded.

Technically, programming should also produce a specific schedule for project execution, particularly for related projects within a programme. Supporting the PPIP models, Netting *et al.* (2008: 27) believe that programmes can start in many ways, i.e. be created by founders, inherited by others, responding to initiatives, and mandated by decision makers.

Furthermore, the execution of related projects should be organised under the umbrella of a programme, and there is a specific management technique for each project (Sowden, 2011). A proper programme and project management are needed to ensure the completion of outputs as a requirement to achieving the outcomes of the programme (Kor and Wijnen, 2007; Sowden, 2011).

Monitoring and evaluation play a central role in this framework. Besides improving programmes, they may also be conducted with the intention of identifying the outcomes of a programme for society (European Commission, 1997a), including how far they can improve socio-economic situations and meet needs. Proper monitoring and evaluation will produce useful feedback for all phases within the framework.

3.5 Organisational Structures of a Programme

In reality, the process of physical development as shown in Figure 3.12 is not linear, and likely to be dynamic with complex iterations. Some of this complexity has already been drawn in the diagram represented by various possible decisions that can be made during the processes. However, not all the complexities can be incorporated into one diagram, and there are more factors which might affect the complexity of these processes, especially within each one.

A programme most likely has more complex internal and external circumstances. This research finds that there are at least five aspects that can influence the level of complexity of the processes, namely typology of the programme, elements of integration, the need to work together, possible programme and project risks, and the

level of importance, urgency, and resistance of each process. The dynamics of these organisational structures are not incorporated implicitly in the broad model of the physical infrastructure development framework because it is not a process in itself; rather, it is more the factors that affect the complexity of the process.

3.5.1 Typology of a Programme

Understanding programme typology improves decision making when managing a programme. In reality, most programmes have a mix of characteristics, but it is helpful to understand the dominant characteristics of a programme to develop and optimise the chosen priorities and approach (Sowden, 2011).

Several different studies have shown profound differences between various programmes and suggested a wide range of programme typologies (Miterev *et al.*, 2016). The programme typology formulated by Ferns (1991), Gray (1997), and Sowden (2011) is useful for this research. Ferns (1991) suggests a typology of three categories of programmes namely:

1. **Strategic programme.** These arise from significant strategic reorientation following a major organisational one-time event and affect organisational structures, strategies, and policies;
2. **Business cycle programme.** These are portfolio type programmes whose major objectives are projected prioritisation and control related to planning and budgeting cycles;
3. **Single objective programme.** This type is close to a megaproject, and often operates outside the boundaries of a single organisation.

Additionally, Sowden (2011) believes that programmes can be categorised as:

1. **Vision-led programme.** These deliver a clearly defined vision and are sponsored by the top of the organisation, tending to be top-down in approach, with cross-functional implications for the organisation's operations; this could be the translation of political priorities into a programme which will refine and deliver the desired changes;
2. **Emergent programme.** These evolve from concurrent, individual projects that have grown within an organisation; a programme is planned when its vision, context and direction have been defined and established;

3. **Compliance programme.** These may also be referred to as a 'must do' programme, as a result of an external event, such as legislative change; benefits may be expressed in terms of compliance, achievement and avoidance of negative implications rather than measurable improvements in performance.

In an alternative typology, Gray (1997) claims that programme dynamics differ according to the exchange of information, the level of control, and the intensity of direct management imposed on the projects. The suggested typology includes:

1. **Loose programme.** Such a programme is used only for reporting, as illustrated in Figure 3.13 below. The programme in this type is, at most, a convenient heading for aggregate reporting or very high-level overview purposes and is more meaningful to the observer than to the participants (Gray, 1997: 5);



Figure 3.13 Loose Programme Model

Source: Gray (1997: 6)

2. **Intermediate open programme.** In these, programme management facilitates information flow to coordinate the projects without directly controlling them.

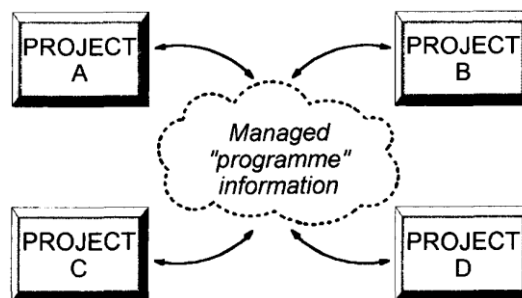


Figure 3.14 Strong Programme Model

Source: Gray (1997: 7)

3. **Strong programme.** Programme management closely controls and directs the projects. It is a much stronger view of a programme in which the element of coordinated central management is implicit (Gray, 1997: 5).

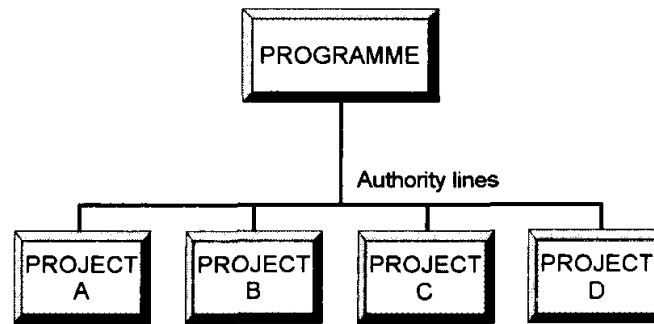


Figure 3.15 Strong Programme Model

Source: Gray (1997: 7)

3.5.2 Elements of Integration

Elements of integration of integration can influence the complexity of the development processes. The more elements that need to be integrated, the more complex the processes can be.

Four Elements to Integrate

In the context of infrastructure development, Davidson and Lindfield (1996: 42–43) presented four elements which require integration: institutional, technical, financial, and spatial, as follows.

1. Institutional integration

This refers to the relationship between the institutions, either governmental, non-governmental, private, and community-based organisations, and their motivation and ability to work together.

2. Technical integration

This involves links between different sectors, for example, links between domestic water supply and farming. The mission from this integration is to create positive links so that increased benefits can be obtained.

3. Financial integration

Financial integration is vital for a programme which has different spending units. Conversely, it is the integration of budgets that creates significant opposition to integration.

4. Spatial integration

Links between different projects are possible when they are in the same location. One of the demands for spatial integration includes spatial planning.

Spatial Organisation Required

For a programme that needs space, relevant stakeholders in the development of the regional water supply infrastructure must have an awareness of the spatial aspect. Crang and Thrift (2000: 1) emphasise that “space is the everywhere of modern thought”. Additionally, Dale and Burrell (2008: xiii) say that space is not just about the arrangement of the organisation’s internal built environment, but about how organisations relate to each other and to the broader social world of which they are a fundamental part.

Accordingly, this Section discusses the organisation of spatial elements as required knowledge for the planning and implementation of a project/programme that needs space, such as infrastructure development. Being unaware of spatial aspects can lead to an unintegrated or disharmonised development. Dale and Burrell (2003) emphasise that a system is spatially aware if it can determine and use its spatial context and its spatial relations in connection with other systems.

Figure 3.16 from Alfasi and Portugali (2007: 172) is helpful to show how the spatial aspect needs to be considered for the development of water supply infrastructure, as well as for the regional supply. They define three basic types of spatial elements, namely singular element, linear element, and spatial element.

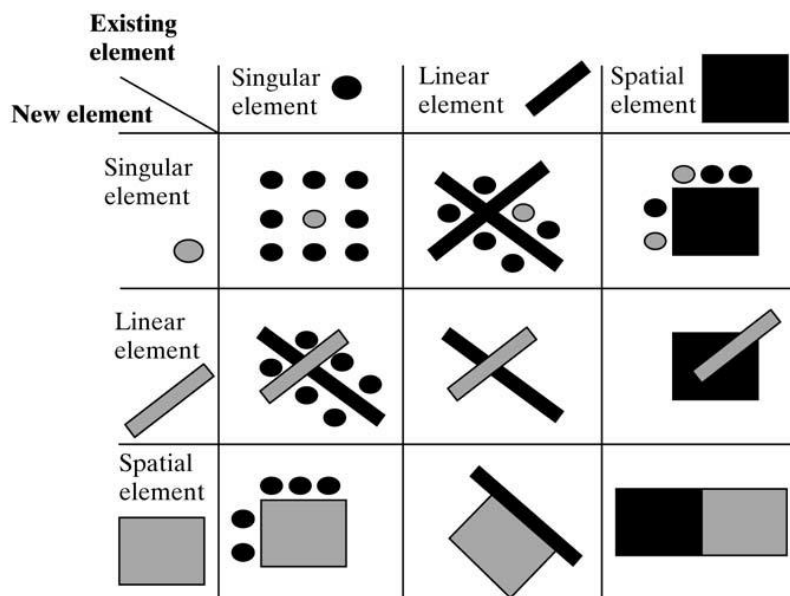


Figure 3.16 Framework of Relations between Spatial Elements

Source: Alfasi and Portugali (2007: 172)

The example of singular elements in the water sector could be a small water reservoir or public water tank. Pipeline networks are categorised as linear elements together with roads and other infrastructure networks. The third element is spatial or

district elements, which are either large elements, such as a large water treatment plant, or entities composed of numerous singular elements, such as a group of water tanks in an area.

It is likely that there will be issues of conflict when two or more elements meet, especially between an element that already exists in the built environment and the planned elements. These possible issues are considered when conducting fieldwork and for analysis in this research. An example of this might be between an existing road and the construction of pipeline networks, as the interaction of two linear elements, or between the development of a large water treatment plant within an agricultural area.

The model in Figure 3.16 cannot be incorporated into the framework of physical infrastructure development processes (Figure 3.12). However, this would affect the decision making throughout the processes from needs assessment and planning until review and evaluation. Anticipating potential conflict between spatial elements, in the beginning, should save time and effort and make the work more efficient.

3.5.3 The Need to Work Together

In relation to the framework of physical infrastructure development processes, and because almost all the processes involve more than one individual and institution working together, it is also essential to discuss the dynamics of this situation. The following discussion starts by discussing a typology of working together, followed by a discussion of the typology of inter-organisational interdependence and the typology of coordination which can be adopted.

Typology of Working Together

One focus of this research was how related institutions work together to achieve intended outcomes. Cooperation, coordination, collaboration, integration, and synergy are the terms that show levels of working together, as shown in the following diagram.

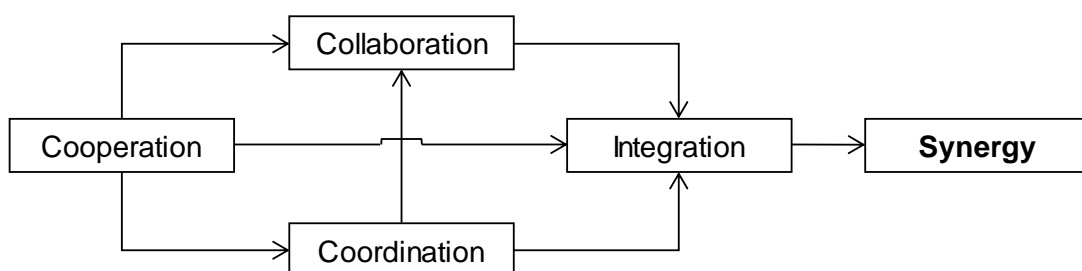


Figure 3.17 Relations of Five Terms of Working Together

The above diagram illustrates the relationships between the five terms of working together. This starts with cooperation as the prerequisite of all other types of team work. Cooperation should be established to have stronger collaboration and coordination. Besides cooperation, collaboration needs established coordination. Nevertheless, integration needs cooperation, coordination, and collaboration to achieve synergy as the final type of working together. Particular definitions of each term and relationships with other levels is discussed next.

1. Cooperation

Cooperation can be defined as the willingness and readiness to share or combine tasks and resources (Nof, 1994: 1). It requires a willingness to work together, depends on good motivation, and it is often founded on understanding (Davidson and Lindfield, 1996). Somehow, it involves a resource-sharing dimension to support goal achievement (Zhong *et al.*, 2015).

Davidson and Lindfield (1996) believe that cooperation is very much contingent on personal relations and trust rather than rules and regulations. The degree of cooperation is proportionate with the success of integration (Nof, 1994). Many efforts are needed to sustain cooperation, such as continuity of goodwill and proper motivation, as the foundation of long-lasting coordination and integration (Davidson and Lindfield, 1996).

2. Coordination

Coordination means integrating or linking together different parts of an organisation to accomplish a collective set of tasks (Van De Ven *et al.*, 1976: 322). It involves the use of communication and information exchange to achieve mutual benefits between entities through working harmoniously (Zhong *et al.*, 2015: 68).

Coordination regularly requires specific established procedures. It is more formal and takes more time but may be necessary, especially where issues are complicated and where bureaucratic organisations are involved (Davidson and Lindfield, 1996: 34).

3. Collaboration

Collaboration involves the functionalities of both coordination and cooperation and refers to the sharing of information, resources, and responsibilities between entities to jointly plan, execute, and analyse the activities required to achieve individual and collective goals (Zhong *et al.*, 2015: 68). It requires active participation and working as a team to sustain collaboration and perform the process of integration effectively (Nof, 1994).

4. Integration

Integration means bringing together into one, which not only requires cooperation and coordination, but also needs a formalised decision-making system and procedures to enable this system to work efficiently and effectively (Davidson and Lindfield, 1996: 34). Davidson and Lindfield (1996: 34) implicitly give an example of this as a project that deals with several different sectors by planning, financing, and managing their implementation together.

Integration is a prerequisite for better (synergistic) results (Nof, 1994: 1). However, inappropriate attempts to integrate can waste time and resources, and this can happen when busy with something with no significant contribution to the achievement of outputs and outcomes (Davidson and Lindfield, 1996: 34).

5. Synergy

Harris (1981; 1984) defines synergy as cooperative or combined actions occurring when diverse or disparate individuals or groups work together to increase effectiveness. Liedtka (1998) emphasises that, in essence, synergy seeks to leverage the capabilities at the level of the individual institution to create new institutional capabilities at a higher level.

Therefore, we could say that synergy is one level above integration. It is more than just 'bringing together into one' because it is also expected to create new capabilities at a higher level. For instance, in the water supply sector, it is not just the physical part of the infrastructure (project output), which then becomes one system, but also how to make the integrated infrastructure have the capability to produce safe potable water as the outcome.

Additionally, Lasker *et al.* (in Weiss *et al.*, 2002: 684) discovered that a partnership creates synergy by combining the perspectives, knowledge, and skills of diverse partners. It enables the partnership to think in new and better ways about how it can achieve its goals, plan more comprehensive, integrated programmes, and strengthen its relationship with the broader community.

Functional Integration

In addition to the above discussions, it is also useful to discuss three principles for functional integration between individuals and organisations that lead to synergy, namely parallel, serial, and simultaneous integration. These principles were theorised by Van der Heijden (in Heeres *et al.*, 2012: 2535) as follows:

- Parallel integration: doing activities that can be done at the same time simultaneously. In planning for land use, this implies allowing for simultaneous emergence of different land use functions in comprehensive developments;
- Serial integration: doing activities in a logical order to maximise how they are performed. Spatial planning requires the reconsideration of the order of process elements within a planning process in order to optimise them;
- Simultaneous integration: sharing resources streams and integrating budgeting can keep down the costs of planning, realisation and management through increasing the efficiency of investments.

Typology of Inter-Organisational Interdependence

The following discussion on types of organisational relations examines the case study based on how the related institutions are building their working relationship. Although Thompson's book, as the source of the discussion, was written long ago in 1967, it remains a rich and complex source of insights into organisational research (Hargadon *et al.*, 2003).

Thompson (1967: 54–55) suggests a simple typology in addressing complexity in the interdependence of organisations, namely pooled, sequential, and reciprocal interdependence. Also, O'Toole and Montjoy (1984: 493) drew this typology as it appears in Figure 3.18. The term 'agency' used in the discussion of the model becomes 'organisation', since agency also refers to ability, power, or capacity to deliver services or goods.

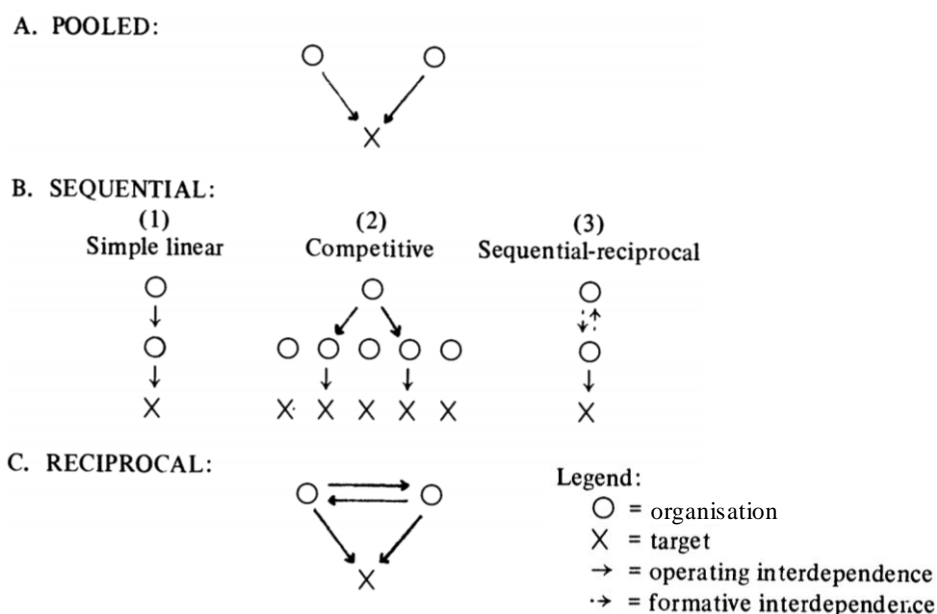


Figure 3.18 Typology of Interdependence

Source: O'Toole Jr. and Montjoy, 1984: 493

A discussion on each typology in the diagram is as follows.

1. **Pooled interdependence.** This occurs when the organisational units involved provide a contribution but do not have to agree or deal with each other in doing so and can do their own thing. With this type, action in each position can proceed without regard to the action in other positions, so long as the overall organisation remains viable (Thompson, 1967). The impact of the absence of this type, or the improper action of one or some units, will be more on the amount of targeted output or outcomes.
2. **Sequential interdependence.** Here, the output of one unit is the input for another. Hence, the organisational units involved cannot ignore each other as they affect each other. Additionally, there should always be a potential contingency in sequential interdependence because each position must be readjusted if any misbehaves or fails to meet expectations (Thompson, 1967).
3. **Reciprocally interdependent.** Two or more institutions fall into this type when each of them possesses contingency for the other (O'Toole Jr. and Montjoy, 1984). With reciprocal interdependence, contingency should not only be the potential action of each position in the set, it must also be adjusted to one or more actions in the set (Thompson, 1967).

This typology will mainly be used to examine the nature of the programme in the case study and whether actions should be conducted sequentially or reciprocally, or with less coordination. However, one limitation of this typology of interdependence is the assumption that the organisational units involved are at the same level or have a similar authority without hierarchy. This missing aspect will be considered in the analysis of this research.

Typology of Coordination

The three types of interdependence –pooled, sequential, and reciprocal –are increasingly difficult for communication, coordination, and decision making because they contain increasing degrees of contingency (Thompson, 1967). Therefore, because of these different complexities, different approaches and devices are required.

To suit the three types of interdependence discussed above, Thompson (1967) developed three types of coordination, namely coordination by standardisation, by the plan, and by mutual adjustment.

1. **Coordination by Standardisation.** This can be sustained when the set of rules is internally consistent. It requires a relatively stable situation and repetitive actions which are few enough to permit the matching of situations with appropriate rules. Coordination by standardisation is appropriate for pooled interdependence where rules are applied only to institutions working independently, and so there is no requirement to rule their interaction.
2. **Coordination by the Plan.** This is exemplified by integrating mechanisms such as the use of pre-established plans, schedules, forecasts, formalised rules, policies and procedures, and standardised information and communication systems (March and Simon, 1993). The mechanisms may govern their actions, and they are appropriate for dynamic situations, such as changing tasks (Van De Ven *et al.*, 1976). Coordination by the plan is appropriate for the type of interdependence that deals with the different levels stability and routine required for coordination by standardisation.
3. **Coordination by Mutual Adjustment.** This is adapted from coordination through feedback by March and Simon (Zuiderwijk and Janssen, 2013). Coordination by mutual adjustment may involve communication and the transmission of information across hierarchical lines during the process of an action. The more variable and unpredictable situation, March and Simon (1993) observe, the higher the reliance on this type of coordination. It is a less crystallised construct (van De Ven *et al.*, 1976). Coordination by mutual adjustment is classed as reciprocal interdependence (Thompson, 1967).

The typology of coordination types is useful to examine whether a group of institutions is correctly managing their relationship, by considering the nature of the executed programme. However, from the three types of coordination where the first two are ruled by the guidance on paper, the last type relies on the quality of the relationship of the organisational units or personnel involved. Unfortunately, the role of the coordinator is not discussed in any of the types described above.

These types of inter-organisational interdependence, coordination, and functional integration were considered during the discussions with key informants in the fieldwork to identify the type of coordination applied in the development of the regional water

supply infrastructure in Metropolitan Bandung. Coupled with the information on the other characteristics of the programme, some answers to the problems hindering synergy in the water supply provision will be revealed.

3.5.4 Possible Programme and Project Risks

The first question in this research is to identify problems with the development of the regional water supply in Metropolitan Bandung at both programme and project level, with a focus on processes and organisational issues. Accordingly, discussing possible risks in the context of the academic literature is beneficial to determine potential problems which have happened in the field.

Sowden (2011: 136–137) anticipates possible risks at four levels: the strategic, programme, project, and operational. Areas to consider as the possible causes of risk at the strategic level include changes driven by external political, economic, social, legislative, environmental and technical factors, dependencies on other programmes and the broader context, and when working with third party suppliers or partners.

Also, common areas of risk and issues within a programme relate to aggregating threats from projects, the management of interdependencies between the programme and its projects, a lack of certainty about funding, unrealistic timescales resulting from poor planning, and the availability of suitable resources to deliver the programme. Much of the focus of risk and issue management within a programme is from the project perspective (Sowden, 2011: 137).

In order to manage the risks to projects, the programme needs to ensure that each project brief outlines risks from the perspective of the programme, and also that regular feedback on the programme risk management activities is given. As projects deliver their outputs, the transition to new ways of working and new systems can lead to further sources of risk at an operational level (Sowden, 2011: 137).

Williams and Parr (2004: 106) list certain critical areas of risk which may occur at different stages of a programme, namely:

1. Procurement risk. This occurs early on in the programme when the main contractual costs are committed.
2. Budgetary risk. This relates to the control of revenue and spending throughout the programme.
3. Delivery risk. This also occurs throughout the programme and relates to the ongoing progress and coordination of projects within the programme.

4. Scope risk. The scope of the programme must be controlled carefully to ensure resources remain focused on the key deliverables, and to minimise complexity and interdependencies.
5. Transition risk. This occurs towards the end of the programme and relates to the effective transition to a post-programme environment with minimal disruption to ongoing operations.

As discussed above, the programme is at risk from many areas. Nevertheless, Bartlett (2002: 92-93) sees people as the common factor across all components, as it is people who undertake the programme, and who are often external to the programme (in the business, suppliers, customers, government, and so on). People risks are common because of poor or no change control, as well as poor commitment of resources because of unsound positioning within the business.

The bigger the scope and expense of a programme or project, the more significant the risks it might have. Flyvbjerg (2014: 6) categorises a programme or project based on expenses as follows: “megaprojects or major programmes” are measured in billions of dollars, “major projects” in hundreds of millions, and “projects” in millions and tens of millions.

3.5.5 Levels of Importance, Urgency, and Resistance

The level of urgency and importance determines how urgent and essential a problem or need is. Furthermore, this consideration might indicate the time available in dealing with such problems or needs. However, the level of resistance determines the best strategy to be used to deal with a particular individual or organisation.

Being aware of the level of importance, urgency, and resistance can affect the response and attitude over a programme or project. It can also affect the level of responsiveness by individuals and organisations in responding to change during the development process. This is another important point to consider in this research given the complexity and length of the water supply development programme in the case study.

Importance and Urgency

This Section discusses how the levels of urgency and importance may be used to prioritise an action, as adapted from the concept of time management by Covey (2004). However, the following discussion is not intended to help justify a particular ‘right’

choice, for instance in prioritising one programme over another, but to help choose which variation of the PPIP model to follow by considering the levels of urgency and importance.

Covey (2004) sees that urgent matters are usually visible and pressing upon an individual, who must respond accordingly, even though very often these matters may be unimportant; importance, however, deals with results that contribute to the achievement of the mission and high priority goals. Based on this definition, Covey (2004) suggests that individuals or organisations should prioritise importance over urgency. This implies that a stimulus should be appropriately analysed to look at the real importance of a programme, rather than urgency, which can be caused by pressure from external factors, such as politics.

From these two variables, four quadrants can be constructed: (1) important and urgent; (2) important but not urgent; (3) not important but urgent, and (4) not important and not urgent. Each has its own characteristics, to which different priority should be given, as elaborated below.

	Urgent	Not Urgent
Important	I ACTIVITIES: Crises Pressing problems Deadline-driven projects	II ACTIVITIES: Prevention, PC activities Relationship building Recognizing new opportunities Planning, recreation
Not Important	III ACTIVITIES: Interruptions, some calls Some mail, some reports Some meetings Proximate, pressing matters Popular activities	IV ACTIVITIES: Trivia, busy work Some mail Some phone calls Time wasters Pleasant activities

Figure 3.19 Importance – Urgency Matrix

Source: Covey, 2004: 151

Covey (2004), as shown in Figure 3.19, gives examples in each quadrant. The examples in Quadrants I and II are more substantial than the other quadrants, which include non-important matters. This classification can be related to the PPIP model as the basis for the consolidated framework, as follows.

(1) Important and urgent

This situation requires immediate attention and action. Covey (2004) calls the activities which fall in this category as “crises” or “problems”. If these are related to the PPIP model, this situation might follow the “invisible hand” model (Stimulus–Implementation), the “direct planning” model (Stimulus–Plan/ Programme–Implementation), or the proposed new model of “direct policy” (Stimulus–Policy–Implementation). These PPIP models offer an immediate response by directly addressing problems or stimuli for implementation.

(2) Important, but not urgent

Covey (2004) indicates that this situation is appropriate for long-range planning and conducting other preparation to be implemented after the plan has been formulated. Activities included in this situation are ones that need to be conducted but are seldom completed quickly because they are not urgent. Following the “classical” model (Stimulus–Policy–Plan/Programme–Implementation) should be appropriate in this situation. Covey (2004) hints that essential matters that are not urgent require more initiative and proactivity.

(3) Not important, but urgent

Individuals or organisations sometimes assume that urgent matters which are not important are also important, but the reality is they are not important (Covey, 2004). Cases that fall into the three PPIP models without further implementation (“policy abort”, “policy-plan abort”, and “direct plan abort” models) might be because a lack of importance that is discovered after several stages have been conducted.

(4) Not important and not urgent

There is nothing to do in this situation, at least initially. The “non-decision” PPIP model (stimulus–stop) might fall into this model.

Urgency and Resistance

Furthermore, Secord (2003: 72) introduces resistance (low and high) as another variable besides urgency, and splits urgency into three categories: low, high, and crisis. The following six combinations of resistance and three types of urgency can be utilised to consider an appropriate response to different situations.

(1) Crisis situation, high resistance

This is a non-conductive situation when the problems or needs are to be addressed immediately, but there is a resistance in preparing and executing it. Secord (2003)

suggests having an individual who can make a decision and may offer the solution to take the right action in time. However, although quick action may be needed, the decision maker should have the vision to avoid problems in the future.

(2) Crisis, low resistance

This situation is better than the previous one with high resistance. For this situation, Secord (2003) suggests that the visionary element remains essential and there may be a need to lean towards a directive approach.

(3) High urgency, high resistance

A “high urgency” situation has more time, although not much, to deal with a problem or need. In this situation, Secord (2003) proposes that there may be a need to balance the benefit of persuasive consultation against the need for a more directive approach, with strong undertones.

(4) High urgency, low resistance

In a high urgency situation, again time cannot be compromised freely unless the number of affected people is small. Secord (2003) suggests that this may require a mix of collaboration and consultation where, because resistance is low, people are willing to follow the lead of someone they trust who inspires them.

(5) Low urgency, high resistance

In this situation, time is available. Secord (2003) suggests that it may be possible to use a collaboration style, but the degree of resistance means that this must also be persuasive, to try to increase the degree of support.

(6) Low urgency, low resistance

Secord (2003) highlights that this situation is ideal for a collaborative approach. There is time to involve those affected by the change, which may lead to better ways of implementing it, and to higher motivation. At the same time, the widespread support for the change means that such participation should be adequate.

This is about the time available and how supportive the related individual or organisation is when accepting the offered change. The first four situations, considering the limitation on time, will be more likely to incremental change. Additionally, the second four will be heading towards transformational or fundamental change. Both more incremental or fundamental types of change should be part of the consideration in arranging the stages required (see Figure 3.12).

3.6 Conclusion

This literature review chapter starts with the discussion on the organisational processes and organisational structure for the physical infrastructure development (Section 3.2). It gives a more detail insight into the scope of this research and reveals how both organisational aspects can be broken down into more detailed constituent parts for the purposes of analysis. One aspect of this framework enables the research to reflect on organisational processes which include work processes, behavioural processes, and change processes, while the other focuses on organisational structure include formal and informal configuration.

The following discussion on the basic framework of the organisational processes taken from the literature ends up with an amalgamated model to describe the necessary processes for physical infrastructure development, with its dynamics. The new model, created by this research, is informed by several basic models that discuss processes from policy formulation to the achievement of outcomes, and its related context. Besides having its advantages, each basic model also has limitations so that the amalgamation with other basic models and conceptions were required.

Table 3.4 Summary of the Advantages and Limitations of the Basic Models

No.	Basic Model	Advantages	Limitations
1.	Policy, Planning, and Implementation (PPIP) model (Figure 3.1)	Details the dynamic relations between policy, planning/programme, and implementation	Does not detail the implementation components and processes
2.	Kor and Wijnen's model relating strategy with projects and programme (Figure 3.10)	Displays the whole cycle from strategy/policy to the review and evaluation of projects and programme	Does not include external factors which might affect the processes
3.	Model of Organisational Performance Production	Shows generic organisational work processes by including internal and external factors	Not specific for programme or projects

The discussions on the organisational processes followed by the discussions on the organisational structures of a programme to gain more complete views on how to manage a programme. It discusses the complexities of the relations between individuals and smaller organisation units within a programme. All these discussions complete the understanding of the dynamics in preparing and implementing a programme and projects, which will be the basis of analyses as presented in the following chapters.

There are core issues that can be synthesised from the literature review, which will be the central discussions throughout this thesis. These issues are also considered for analytical purposes, namely overview on the conception of organisational processes and structure, an extensive organisational processes of physical infrastructure development, the complexity of the organisational structure of a programme, and a proven example of successful planning, programming, and budgeting system (PPBS).

Table 3.5 The Core Issues from the Literature

No.	Subject	Core Issues
1.	Organisational processes	Not merely include work processes, but also related to behavioural and change processes
2.	Organisational structure	Not only related to formal structure, but also highlights the informal configuration of an organisation
3.	Organisational Processes of Physical Infrastructure Development	The processes are very extensive that involves needs assessment, policy formulation, planning, programming, budgeting, projects implementation with its output and outcomes, and review and evaluation
4.	Organisational Structures of a Programme	The reviewed literature demonstrates the complexity and dynamics of a programme that can be affected by the characteristics of the programme's components
5.	Planning, Programming, and Budgeting System (PPBS)	It is possible to develop such a system that integrate planning with programming and budgeting prior to its implementation. The US successfully apply PPBS and has been replicated in many other countries, such as Canada, Australia, etc.

The literature review was conducted in line with the abductive research approach. The literature was not only reviewed once but was re-reviewed several times. Adjustments were made iteratively informed by the needs of the fieldwork studies and considering the requirements for analysis to answer the research question. Hence, this chapter is closely linked with the previous and following chapters for analysis.

This page is intentionally left blank

CHAPTER 4

ANALYSIS OF INDONESIA'S NATIONAL GOVERNANCE AND GOVERNMENT SYSTEM

CHAPTER 4 ANALYSIS OF INDONESIA'S NATIONAL GOVERNANCE AND GOVERNMENT SYSTEM

4.1	Introduction	111
4.2	National Governance System.....	111
4.2.1	Decentralised System in Indonesia	111
4.2.2	Political System.....	113
4.2.3	Government System.....	117
4.3	Dual Planning System.....	121
4.3.1	National Development Planning System.....	121
4.3.2	Spatial Planning System.....	125
4.3.3	Challenges with the Dual Planning System	127
4.4	Budgeting System	129
4.4.1	Relations between the Planning and Budgeting Systems	129
4.4.2	Budgeting Milestones	130
4.4.3	Budget Revision	132
4.4.4	Challenges with the Current Budgeting System.....	132
4.5	Monitoring and Evaluation System	134
4.5.1	Monitoring and Evaluation in the Development Planning System	134
	<i>Monitoring as a Part of Development Control</i>	<i>134</i>
	<i>Evaluation</i>	<i>135</i>
	<i>Reporting</i>	<i>136</i>
4.5.2	Monitoring and Evaluation in Spatial Planning System	137
4.5.3	Challenges with the Monitoring and Evaluation System.....	137
4.6	National Issues, Policies, and Strategies for Water Supply Development.....	138
4.6.1	National Issues on Water Supply Infrastructure Development	138
	<i>Limited Coverage of Safe Water.....</i>	<i>139</i>
	<i>Political Will at the Local Government Level.....</i>	<i>139</i>
	<i>Financial Issues</i>	<i>140</i>
4.6.2	National Target and Policies.....	140
4.6.3	National Strategy.....	143
4.6.4	The Need for a Regional Water Supply System	143
4.7	Organisations Involved in the Water Supply Sector.....	146
4.7.1	Ministry of Public Works and Housing (MoPWH).....	147
4.7.2	National Planning Board.....	147
4.7.3	Ministry of Agrarian Affairs and Spatial Management	148
4.7.4	Ministry of Finance	148
4.7.5	Ministry of Villages, Development of Developing Regions, and Transmigration..	149
4.8	Conclusion	151

4.1 Introduction

This chapter aims to achieve the second research objective of identifying the challenges facing the current water supply development system in Metropolitan Bandung from external factors, i.e. the national governance and government system. The national system certainly affects sectoral development, including the water supply sector, and also affects development at various levels of government, i.e. at provincial, local (city/regency) level. The national system also affects regional cooperation involving more than one local government.

This chapter starts by discussing the national governance system. The following discussion is on the current Planning, Budgeting, and Monitoring and Evaluation System of the current government system. The chapter concludes by discussing national issues, policies, and strategies on water supply development as the input to identify challenges at the provincial, regional, and local levels.

4.2 National Governance System

From many definitions of governance, the preferred definition for this research is taken from UNDP (1997). Governance is defined as the exercise of political, economic, and administrative authority in the management of a country's affairs at all levels, and comprises complex mechanisms, processes and institutions (UNDP, 1997: 3). The focus of this definition at country level, with its complexity, fits the research focus on the management of water supply infrastructure development, as it comprises all levels of government impacted by the national administrative and political system.

Accordingly, this Section covers the identification of challenges from the decentralised system, as the underlying system in Indonesia since 2001, and the current political and government systems. However, the discussion does not cover all the details of the national system; rather, it focuses on those related to the research scope on water supply development. The discussion at the national level is utilised for analysis of the case study and formulating recommendations from this research.

4.2.1 *Decentralised System in Indonesia*

Decentralisation, or decentralising governance, refers to the restructuring or reorganisation of authority so that there is a system of co-responsibility between

institutions of governance at the central, regional, and local levels (UNDP, 1997: 4). It involves the transfer of significant degrees of authority and responsibility for governmental expenditure and revenue from the central government to lower levels of government (Alm, 2001). In the Indonesian context, the law define decentralisation as the transfer of some central government affairs to autonomous regions based on the principle of autonomy (Gol, 2014).

The Republic of Indonesia embarked on decentralisation in 2001 following the effective application of two laws on Regional Government [*Pemerintahan Daerah*] and Regional Fiscal Balance [*Perimbangan Keuangan antara Pemerintah Pusat dan Daerah*], enacted in 1999 but with the implementation commenced in 2001 (Gol, 1999a; Gol, 199b). Indonesia's 2001 decentralised system has rapidly changed the country from one of the most centralised systems in the world to one of the most decentralised, as it has a greatly changed fiscal programme, and administrative and political decentralisation at the same time (World Bank, 2003).

Furthermore, considering the flaws in the 1999 laws, and in search of better rules, both laws were revised in 2004 (Gol, 2004a; Gol, 2004b). The new decentralisation policy is intended to make the government closer to the people by empowering local and provincial governments, local legislature councils, and local communities (Firman, 2009). People's needs, including for water supply, are expected to be identified and responded to by local government as early as possible.

The decentralised system in Indonesia is also closely related to the term Regional Autonomy.² By law, it authorises and obligates autonomous regions to set up and manage their affairs in the interests of local communities. Implementation of this autonomy has greatly changed the current situation, as the local governments have more authority and discretion to decide their development programmes and practice (Firman, 2014).

Regional autonomy can lead to the tendency of local governments in Indonesia to be inward-looking in their development orientation, which, in turn, becomes a problem for regional development, since local and regional development should be planned, implemented, and monitored across administrative boundaries (Firman, 2014). Accordingly, at present, it is much more difficult to build coordination for regional development (Firman, 2009).

² Regional here covers provincial and local (city and regency).

Decentralisation is not a linear or consistent process, and it can suffer reverses as often as advances in terms of how local governments and citizens take up its challenges (Grindle, 2007: 178). Nevertheless, decentralisation could also be expected to contribute to key elements of good governance, such as increasing people's opportunities for participation in economic, social and political decisions, assisting in developing people's capacities, and enhancing government responsiveness, transparency and accountability (UNDP, 1997: 4).

4.2.2 Political System

Currently, after four amendments of the 1945 Constitution with the last amendment in 2002, there are three political branches as mandated by the amended constitution, namely the legislative, executive, and judicative, and completed by a Supreme Audit Board as an independent body outside the three (Rol, 2002). All three bodies have equal authority, as can be seen in Figure 4.1.

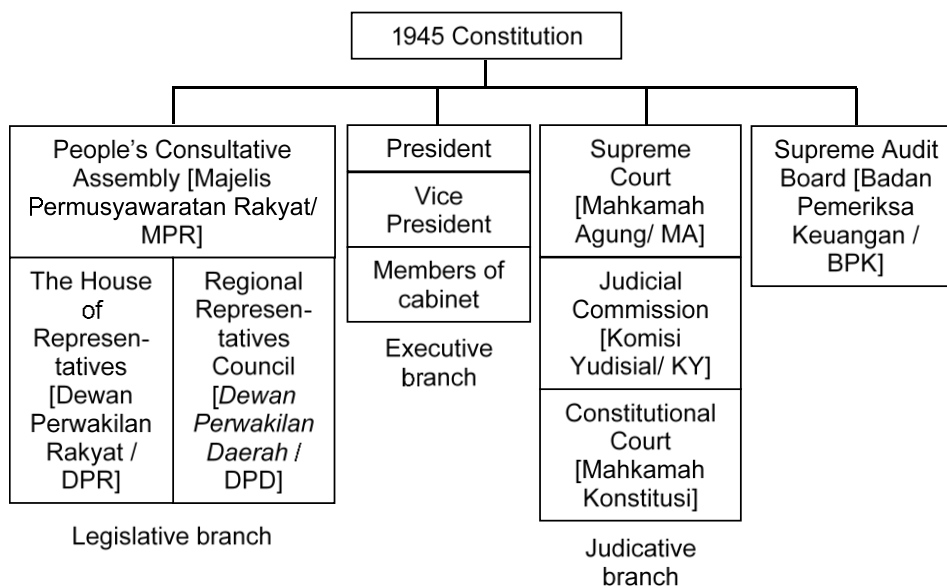


Figure 4.1 Organisational Structure of the Political System in Indonesia

Other political bodies related to water supply development at the national and lower levels, besides the executive branch as the programme implementer, are the House of Representatives, Regional Representatives, Constitutional Court, and also the Supreme Audit Board. The roles of these bodies are discussed below.

Executive Branch

The Indonesian national executive branch is headed by a president, who holds the power of government. The president and vice-president are elected as a pair directly

by the people, most recently in April 2019. They hold office for a term of five years and can subsequently be re-elected to the same office for one further term.

The president forms a cabinet comprised of ministers as the head of line ministries, state ministries, and coordinating ministries. The president may also establish an advisory council with the duty of giving advice and opinions to the president and other assisting bodies. A similar structure is applied to provincial and local (city/regency) government, which is discussed in detail in the Section on the government system (Rol, 2002).

Each minister has responsibility for their particular area of government's roles and activities. Water supply development is included under a ministry that deals with infrastructure development, and it has general responsibility for (Gol, 2015b):

1. Formulation and implementation of policies in their sectors;
2. Management of state assets within his responsibility;
3. Supervision of the execution of duties in their sectors;
4. Delivery of technical guidance and supervision on the implementation of the ministry's affairs at a regional level; and
5. Implementation of national scale technical activities.

The Ministry of Public Works and Housing leads the physical infrastructure development for water supply, besides other ministries and bodies with their respective roles and responsibilities.³ Two Directorate Generals under the ministry deal with the domestic water sector, namely the Directorate General of Water Resources for raw or untreated water, and the Directorate General of Human Settlements for the water treatment infrastructure and provision of advice for provincial and local governments (Gol, 2015a).

Booth (2005) underlines that probably no single issue is as crucial for the future of public administration in Indonesia as the relationship between the various ministries, boards, and agencies of the central government and the newly empowered regional governments, especially at the local level. This is part of the challenge of synergising all resources from all organisations more effectively and efficiently.

³ Elaborated further in section 4.7

The House of Representatives [Dewan Perwakilan Rakyat/ DPR]

The DPR or House of Representatives is the parliament of Indonesia. Members of the DPR are elected through a general election once every five years, with the last election being in 2019. They hold the authority to establish laws. Each bill should be discussed by the DPR and the president to reach joint approval. If the discussed bill is agreed, the president signs a jointly approved bill to become law (RoI, 2002).

Besides holding the legislative function, the DPR also has budgeting and oversight functions. Of these three functions, based on the intensity and regularity, the budgeting function is more closely related to water supply development. Government institutions do not have regular interactions with the DPR for legislative purposes or oversight of the development.

The annual budgeting processes in parliament can take three to four months each year, from August to November. This does not include lengthy discussions when there is a significant budget revision in the middle of the fiscal year. The budgeting agenda with the DPR includes the approval of fiscal policy, discussions on the content of budget proposals, and approving the budget proposal (Blöndal *et al.*, 2009).

Blöndal *et al.* (2009) highlight that the involvement of the DPR in budgeting processes is to provide detail on many occasions throughout the budget process. Concerning this issue, the Constitutional Court in 2013 has been limiting the DPR to discussion of budget detail only up to one level under the ministerial budget at 'programme' level.⁴ However, discussions in the meetings with parliament remain very detailed down to the project level in particular areas. This is not inevitable because the oath of the members of the DPR is to attend to their respective constituents.

DPR also exist at provincial/residential/city levels, called DPRD [*Dewan Perwakilan Rakyat Daerah*]. DPRD members are also elected for five year terms but not necessarily over the same period as DPR members. The DPRD have similar roles to DPR in different geographical scope. They are all members of political parties (RoI, 2002).

The Regional Representatives Council [Dewan Perwakilan Daerah / DPD]

The DPD is the Senate of Indonesia. Senators may propose a bill to parliament related to the regional autonomy, the relationship of central and local government, formation,

⁴ Programme here is the aggregation of budget allocation in Echelon 1 units, 1 level under ministry.

expansion and merger of regions, management of natural resources and other economic resources, and bills related to the financial balance between the centre and the regions. Furthermore, the DPD participates in the discussion of proposed bills. It provides consideration to the DPR over bills concerning the annual state budget, taxation, education, and religion (RoI, 2002).

The DPD may oversee the implementation of laws concerning regional autonomy and the other concerns mentioned above, and it can submit the outcomes from their oversight to the DPR in the form of materials for further consideration and action. Like the DPR, the DPD holds a session at least once per year (RoI, 2002).

Constitutional Court

The Constitutional Court is a judicial branch which possesses the ultimate power of decision in reviewing laws against the Constitution. The Court also determines disputes over the authority of state institutions whose powers are provided by this Constitution, decides over the dissolution of a political party, and rules on disputes over the results of general elections (RoI, 2002).

In the water supply sector, a crucial decision was made by the Constitutional Court to revoke Law No.7/2004 on Water Resources and reinstate Law No.11/1974 on Irrigation, as the controlling legislation, until a new measure can be formulated. The court argues that the 2004 law encouraged the commercialisation of water resources at the people's expense, even though the Constitution says "the land, water, and natural resources are controlled by the state and used for the greatest possible prosperity of the people."

Accordingly, the court stated that the private sector could not be granted exclusive rights to water resources (such as rivers and springs), and should only be allowed access to water sources as licensed and regulated by the state (Ray and Ing, 2016: 22-23). Therefore, most water supply companies in Indonesia are not fully privatised but under respective local (city or regency) government regulation.

Supreme Audit Board [Badan Pemeriksa Keuangan / BPK]

Indonesia Supreme Audit Board is an independent high state body for the evaluation of management and accountability of state finances managed by central and local governments, and both state-owned and local government enterprises including water

companies. According to the constitution, the roles of the BPK are as follows (RoI, 2002):

- Investigate the management and accountability of state finances;
- Submit the result of an investigation of state finances to the DPR, DPD, or DPRD, in line with their respective oversight authority;
- Take action following the result of any such investigation by respective institutions and bodies according to law.

The BPK may take samples for auditing purposes, including from organisational units running water supply projects. Very detailed audits can be taken of the administrative process of project financial management, especially the expenditure or spending processes.

4.2.3 Government System

The following discussion on the government system presents the hierarchy of government and the structure of the regional system as developed for Metropolitan Bandung. Additionally, an overview of the division of government functions is also essential to understand the reason why water supply development is the domain of local government.

The overview of regulations hierarchy in Indonesia also needs to be discussed since the analysis of the case study relates to this. Further, it is essential to discuss the internal government audit entity which currently gives attention to synchronisation between planning and implementation.

Hierarchy of Government

The Unitary State of the Republic of Indonesia is divided into provinces. A province is divided into cities [*Kota*] and regencies [*Kabupaten*],⁵ which stand at the same level. Each province, city, and regency bases its authority on the principle of regional autonomy.⁶ Under the regencies and cities, there are districts and urban and rural villages (see Figure 4.2).

The regional system in terms of water supply is across two local (city or regency) administrative areas, potentially within a province or across provinces. A provincial

⁵ A city [*Kota*] is more urbanised than a regency [*Kabupaten*].

⁶ There are currently 34 provinces comprising 430 regencies and 99 cities (Lewis, 2018: 28).

government will have a coordinating role when the regional system is within their area, while the central government will play more of a role when the regional system involves two or more provinces. The case of Metropolitan Bandung is within the area of West Java Province.

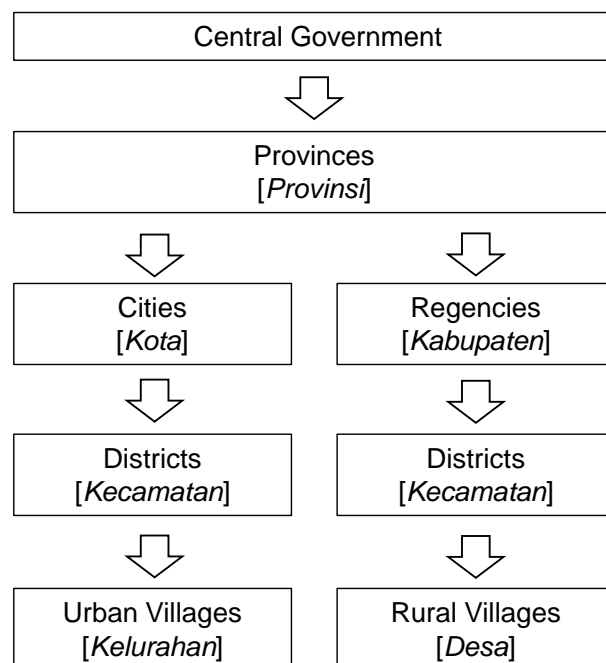


Figure 4.2 Hierarchy of Government in Indonesia

The Divisions of Government Functions

The current law regarding regional government [*Pemerintah Daerah*]⁷ outlines the responsibility of central and provincial governments for a range of public services. Certain affairs are the domain of the central government and cannot be decentralised, i.e. foreign affairs, defence, police, justice, national monetary and fiscal policy, and religion. Other functions are concurrently managed by the central and provincial and local governments.

According to the law, water supply falls under the public works sector, while water supply development is under the domain of the city/regency government. The provision of water supply is a concurrent function between central, provincial, and local government. Water supply demand within the administrative area of a city/regency is the domain of local government, while the provincial government can assist when the water infrastructure system is beyond a regency/city administrative border.

⁷ Law No.23/2014.

The central government can assist the development of water supply infrastructure when it is across two or more provinces, or for national strategic purposes, for example in a strategic national area that has been set in the national spatial plan. Metropolitan Bandung is one such national strategic areas as a national development centre.

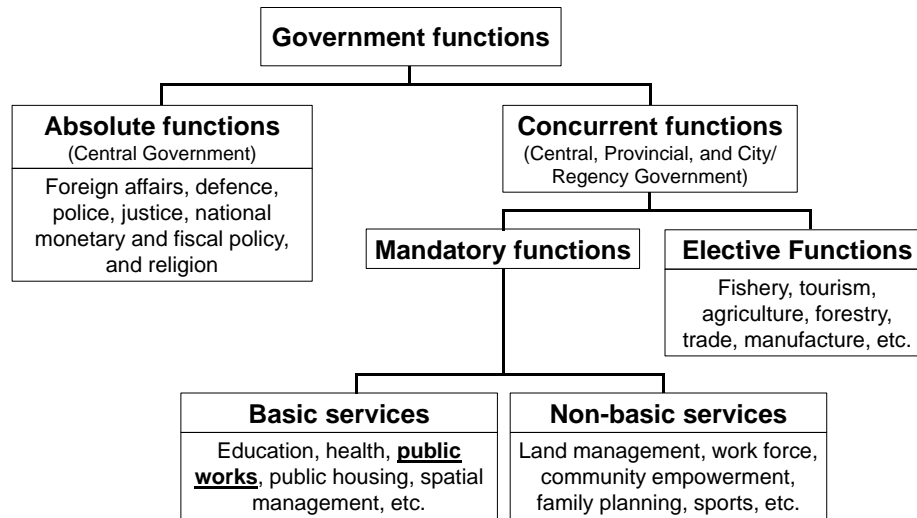


Figure 4.3 Divisions of Government Functions

Source: extracted from Law No.23/2014 concerning

Hierarchy of Regulations

Since the case study concerns legal aspects, it is necessary to include an overview of the hierarchy of regulations in Indonesia. According to the 2004 law concerning the establishment of laws and regulations, the hierarchy of regulations in Indonesia is as follows (GoI, 2011):

1. 1945 Constitution [*Undang-undang Dasar 1945*];
2. Law [*Undang-undang*]; Agreed by the House of Representatives and the President;
3. Government regulations [*Peraturan Pemerintah*] determined by the President;
4. Presidential regulations [*Peraturan Presiden*];
5. Provincial/local regulations [*Peraturan Daerah*], formulated by the provincial/ local House of Representatives with an agreement with the missing word.

The formulation of lower hierarchy regulations should be in accordance with referenced law and not against other established law or regulations at the same level. A dispute with laws against the constitution can be resolved by the Constitutional Court, and for the lower level can be proceeded by the other legislative branches. The legislation is usually confined to statements of general principle, with details filled in later in various decrees, instructions, and so on (Booth, 2005: 210).

Besides the above hierarchy, it is also possible to formulate and have sectoral regulations become statutory, in the form of ministerial regulations [*Peraturan Menteri*], governors or regents/mayors regulation [*Peraturan Gubernur or Bupati/Walikota*]. For example, the Ministry of Public Works and Housing's Regulation concerning the water supply management system [*Penyelenggaraan Sistem Penyediaan Air Minum*] is the guideline for all levels of government providing water supply.

The Board of Finance and Development Surveillance [Badan Pengawasan Keuangan dan Pembangunan / BPKP]

As discussed earlier, the Supreme Audit Board [*Badan Pemeriksa Keuangan/ BPK*] is an external auditor, and there is also an internal independent surveillance body and auditor, i.e. the BPKP. The roles of the BPKP range from assisting the execution of strategic development plans and policies to creating supervisory policies and the government's internal control system, ultimately attributed to ensuring the fruitfulness and accountability of national development programmes.

According to its official web page,⁸ the institution is directed not only to conduct oversight over activities but also to assure the overall effectiveness of the public management and governance system. As such, the elaboration of the supervisory activities of the BPKP has now been extended to consulting and assurance assignments, with a specific approach to control, risk, and governance.

Nationwide, the BPKP conduct reviews, evaluations, monitoring, quality assurance, and management consultation from the perspective of public finance, performance, cross-sectoral activities, and other presidential mandates. The BPKP has a close relationship with the internal auditor in each institution at central, provincial, and local government levels.

It is agreeable that the BPKP has started to audit the consistency between planning, budgeting, and its implementation, and I was one of the auditees in 2014. For the current situation, a member of the budgeting staff from the Directorate of Water Supply⁹ said, "There was an audit by the BPKP, and they recommend us to be consistent between planning and budgeting. There should not be an allocated budget for a project which is not in the list of a plan".

⁸ www.bpkp.go.id (Accessed 18 August 2018).

⁹ Under Ministry of Public Works and Housing.

4.3 Dual Planning System

According to Healey (1997: 72), the planning system is “systems of law and procedure that set the ground rules for planning practice”. Therefore, in essence, a planning system provides a legal and regulatory framework for the practice of planning (Hudalah and Woltjer, 2007: 292).

Indonesia applies a dual planning system regulated in law, namely the spatial planning system¹⁰ and national development planning system.¹¹ As indicated by its name, spatial planning is a spatial-based planning system, while the development planning system regulates time-based planning which has a close relation to the budgeting process. The other distinction is that development planning mainly regulates the planning system for the government, from local to the central government, while spatial plans are used both for the public sector and non-government organisations.

4.3.1 National Development Planning System

The discussion here is around mandates from the law, relations between development planning documents, and the timeline that should be followed in conducting planning processes. It is useful as the basis on which to understand the organisational processes in the case study water supply development programme. The critical issues around the planning systems are discussed separately in this Section.

Overview

Law No.25/2004 regarding the National Development Planning System mainly outlines the systematic development planning process conducted by the central, provincial and local governments, and it also regulates the preparation and approval of plans. The National Development Planning System is a set of development planning procedures to formulate long-term (20 years), medium-term (five years), and annual development plans carried out by state administrators and communities at the central and regional levels. All the processes of the national development planning are coordinated by the National Planning Board [*Badan Perencanaan Pembangunan Nasional/ Bappenas*].

¹⁰ Based on Law No. 26/2007 regarding Spatial Management.

¹¹ Based on Law No. 25/2004 regarding National Development Planning System.

According to the law, the National Development Planning System was established to (Gol, 2004c):

1. Support coordination between development actors;
2. Guarantee the creation of integration, synchronisation, and synergy between regions, between spaces, across times, between government functions, and between central and regional;
3. Ensure links and consistency between planning, budgeting, implementation and supervision;
4. Optimise community participation; and
5. Guarantee efficient, effective, equitable and sustainable use of resources.

An essential planning activity at all levels of government is named the Development Planning Forum [*Musyawarah Perencanaan Pembangunan/ Musrenbang*], and this is held from the village to the national level. It is an inter-government agency forum for preparing national/provincial/local development plans (Gol, 2004c).

Relations between Development Planning Documents

Long-term, medium-term, and annual plans are applied for all levels of government and each ministry, agency, or board of the government (Gol, 2004c). A development planning forum [Musrenbang] should be held in preparation for each development plan, by involving communities and non-government organisations. These plans should relate to each other following the hierarchy as shown in Figure 4.4.

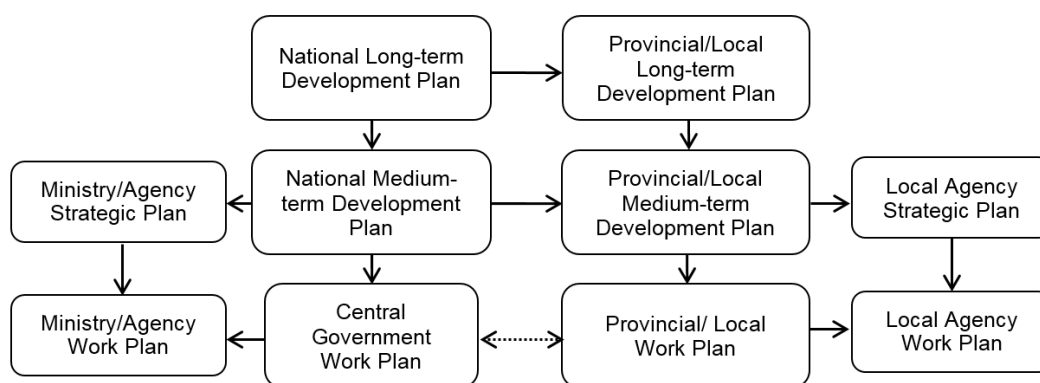


Figure 4.4 Indonesia's National Development Planning System

Source: extracted from Gol (2004c)

The National Long-term Development Plan [*Rencana Pembangunan Jangka Panjang/ RPJP*] is an elaboration of the objectives of the establishment of the State of Indonesia, as outlined in the Preamble of the 1945 Constitution. The content of the

RPJP covers the vision, mission, and direction of national development with a huge target to be achieved. This plan is reformulated every 20 years.

The National Medium-Term Development Plan [*Rencana Pembangunan Jangka Menengah/ RPJM*] is the elaboration of the elected president's vision, mission, and programmes guided by the National RPJP. It includes national development strategies, general policies, the programmes of each ministry and institution, and across ministries, institutions, territories and regions, as well as macroeconomic frameworks. The RPJM also includes an overall picture of the economy and the direction of fiscal policy in the form of an indicative regulatory framework and funding framework.

The Government Work Plan [*Rencana Kerja Pemerintah / RKP*] is an elaboration of the National RPJM for the annual plan. It contains development priorities, a macroeconomic framework design that includes a comprehensive picture of the economy including fiscal policy directions, as well as programmes of the ministry/ agency, cross ministries/ agencies, and territories in the form of regulatory and funding frameworks that are indicative.

Water infrastructure development plans are included both in the Long-term, Medium-term, and Annual Development Plans in various detail. They usually contain identification of problems, policy direction, strategies, and targets. Most of the programmes are only mentioned in the aggregate target nationally, e.g. several villages or districts will be served. It occasionally mentions programmes with a more specific location than province or city/regency level.

Besides regulating the planning process, the national development planning system also mandates the control and evaluation of the implementation of the plan. Such control is carried out by the respective head of the ministries/agencies, and the results from evaluation become feedback for the preparation of development plans for the following period.

The provincial and local planning processes are relatively similar, with the difference being that the planning process at the provincial and lower levels of government is supervised by the Ministry of Home Affairs. The Ministry has its role in managing all planning activities at these levels, and reviewing the content of local plans according to national policies.

Planning Milestones

The annual development planning process is a milestone that is relatively the same for each year, as can be seen in Figure 4.5. This is what the government should do according to the law. However, the details for the exact time in each year are circulated by the National Planning Board [*Bappenas*] for central government institutions and by the Ministry of Home Affairs for the planning process at the provincial and local levels.

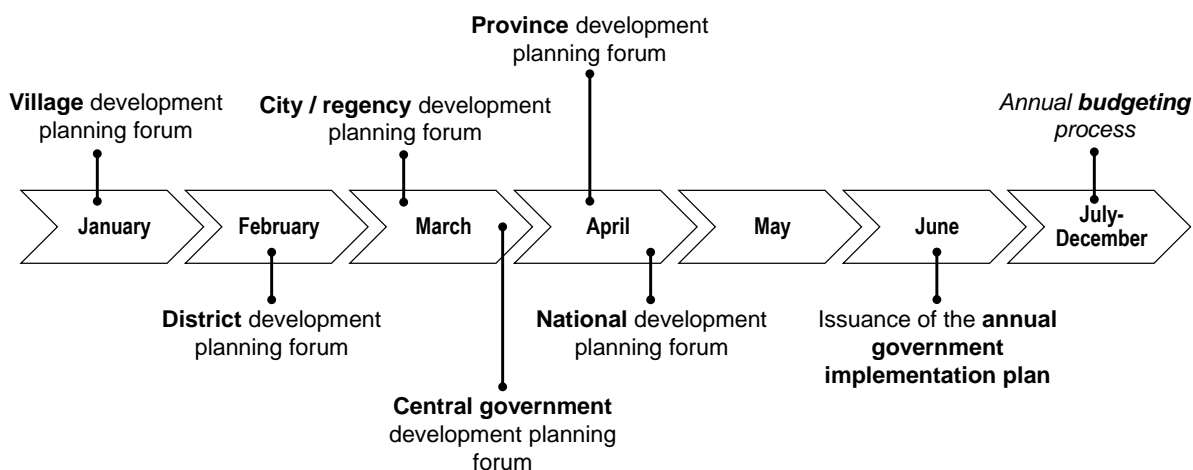


Figure 4.5 Milestones for Annual Development Planning

Source: extracted from GoI (2004c)

The annual planning process starts with a village development forum in January. The expected result is the village's annual work plan, which should be formulated using a participatory approach. Aspirations that cannot be implemented by the village budget allocation in the next budget year can be rolled on to the next budget year or put forward for discussion at the upper-level forum.

Similar development planning forums are held at the district, city or regency, and provincial levels from February to April each year. The preparation and initial discussions are held beforehand to arrive at the final draft or annual work plan for each level of government.

As can be seen from Figure 4.5, there is also a series of forums at the national level with a peak in March and April. This series is held in the framework of preparing the annual Government Work Plan [RKP]. It aims to improve the final draft of the RKP by synchronising it with the annual work plan of the ministries and other agencies. It will also provide directions for improving the final draft of the RKP at the provincial and municipal levels.

The output of these annual development planning processes is an annual work plan at each government level. The annual work plan of the central government is issued in mid-June each year, followed by the budgeting process. The discussions on the relationship between planning and the budgeting process will be elaborated later in Section 4.4.1.

4.3.2 Spatial Planning System

The current law on spatial management [*penataan ruang*] was established in 2007 as an amendment to the similar law in 1992 (Gol, 2007). The spirit of this law is not merely the spatial ordering at the planning stage, but also that the same emphasis is laid on spatial utilisation [*pemanfaatan*] and spatial supervision and control. Therefore, the new law introduces sanctions for the violations of a spatial plan, to improve attention to effective control of spatial utilisation.

Four major traditions of spatial planning have been identified by the European Commission (1997b: 36-37), namely, the regional economic planning approach, the comprehensive, integrated approach, land use management, and the urbanism tradition. Considering its laws and its practices, Indonesian spatial planning is much closer to the application of a comprehensive, integrated approach to spatial planning. This is indicated by the fact that spatial planning in Indonesia is conducted through a systematic and formal hierarchy of plans, from the national to local level, which coordinates public sector activities across different sectors by focusing on spatial coordination.

According to Indonesian law, spatial planning is defined as a process to determine the spatial structure and pattern that includes the preparation and enactment of the spatial plan. A spatial structure plan is the arrangement of the settlement's centre and infrastructure network as a means to support social and economic activities, while the spatial pattern plan is the distribution of space allocation in an area, including the distribution of protected areas and utilisation/buildable areas.

Physical development that needs land space should be indicated in the planning documents, especially for road infrastructure and other transportation facilities as part of a spatial structure plan. However, not all types of infrastructure can be drawn on the plans due to the size of the built element, such as pipeline networks for water the supply system, which are usually small in size and hidden underground.

A senior planner at the Ministry of Agrarian Affairs and Spatial Management said, “Just because an infrastructure item is not included in the spatial plan, this does not mean it cannot be constructed. The map cannot accommodate all infrastructure items due to the map’s scale. What must be included is infrastructure that requires a big parcel of land.” This applies to water supply infrastructure, especially for pipelines and small reservoirs which do not fit on the plan due to their size.

Notwithstanding the principle of regional autonomy, the current Spatial Management Law has developed into a hierarchical system, to ensure consistency in different levels of spatial planning documents (see Figure 4.6). The law was then detailed by government regulation in 2010 regarding the organisation of spatial management [*penyelenggaraan penataan ruang*].

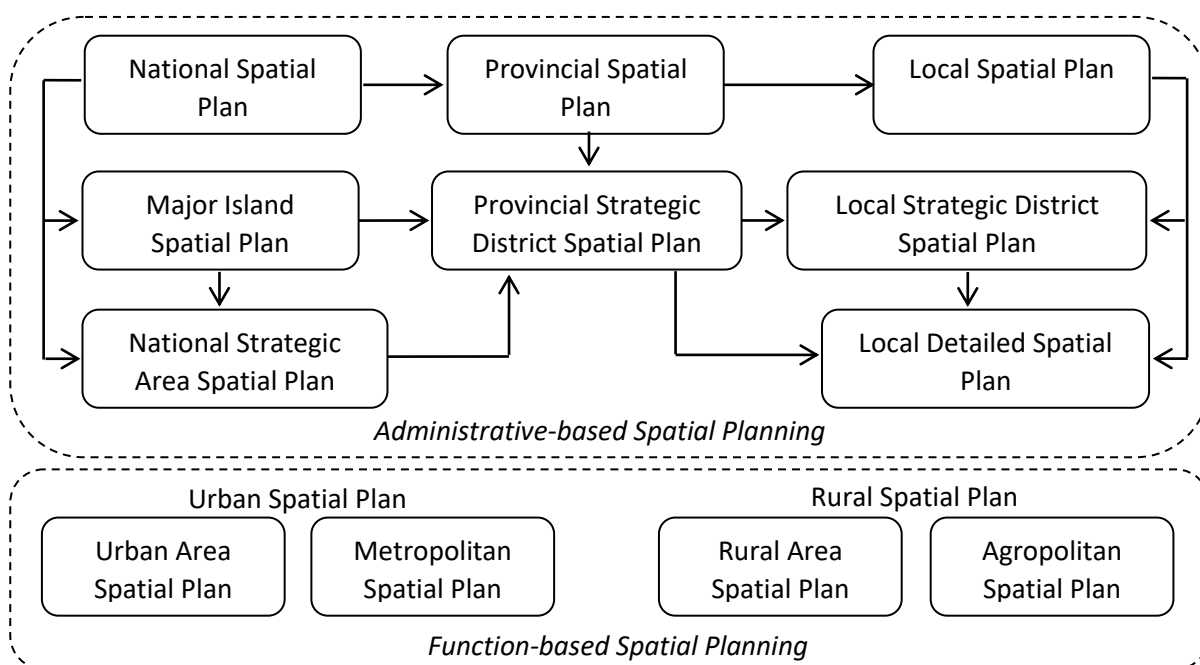


Figure 4.6 Spatial Planning System in Indonesia

Source: Extracted from Gol (2007)

There are two groups of spatial plans: administrative border, and functional-based spatial planning. This grouping is not only for a spatial plan based on administrative boundaries, but also to accommodate the functional-based, which might be across or inter-administrative borders.

Function-based plans are divided into urban and rural spatial plans. The urban spatial plans can be in the form of urban area or metropolitan for an independent city or a group of cities with its population of at least one million inhabitants. The rural spatial plan is for a rural area.

Administrative-based spatial plans regulate links between national, provincial, and local plans, as well as spatial island or national strategic plans. Spatial plans for a particular area, so-called strategic areas, are needed due to the high demand for space or an area for accelerating a specific development, such as in Metropolitan Region like Bandung.

A positive new Ministerial Regulation¹² was formed in early 2018 to include the regional water system in provincial spatial plans (MoAASM, 2018). This new point is implicitly stated in the first appendix of the first Ministerial Regulation stipulated in early 2018. This regulation is expected to make the regional domestic water supply a stronger back up to be prioritised for its implementation.

4.3.3 Challenges with the Dual Planning System

From the analysis of the current planning system, and based on interviews with key informants, there are challenges with the current planning system and its implementation. These are related to availability and reliability of data as input for planning, clarity of planning documents, synchronisation between plans, the approach to formulating a planning document, and commitment to the plans.

The law emphasises that development planning must be formulated using accurate and reliable data and information. However, it is not a simple task to perform, and there are various problems regarding availability and reliability. Concerning the lack of accuracy and reliability, a senior planner in the National Planning Board said, "If we talk about data, we need a strategy to build a reliable one. So much data is useless because of wrong survey indicators and outputs. To fix this, the National Statistics Office has a problem to add even one question in their national survey due to budget constraints, since the change demands more training, and so on. It is a high cost."

Further, she added, "Another difficulty concerning the data is that many institutions are unwilling to share. For example, the Ministry of Public Works and Housing has very detailed data on their information system that records water supply at the district level, but they are not willing to share!" As a consequence, she said, "planning and budgeting are poorly connected because of the lack of reliable data".

¹² Ministry of Agrarian Affairs and Spatial Management.

The clarity in planning documents is also an issue here. A public administration lecturer, who can identify the lack of clarity in plans, said, "One of the causes of the gap between planning and implementation is the lack of capacity in preparing 'programme logic' at the beginning of the planning process. It is frequent to see that the logic is not clear. For example, with the clarity between the goals to achieve and which programme should delivered them."

She then added, "The importance of using logical models to detail the goals and the responsible stakeholders is not only for implementation but also to clarify the design for monitoring and evaluating the programme". A senior planner in the Ministry of Agrarian Affairs and Spatial Management admitted this fact by referring to a possible cause, "All the formulation of plans is done by a third party, i.e. a planning consultant. Unfortunately, their quality needs to be significantly improved. Logically, they must be smarter than us, mustn't they?"

There is also the issue of the synchronisation between planning documents. For example, an administrator in the National Planning Board said that there is a problem in linking the National Long-Term Development Plan (RPJMN) with what should be done by the line ministries. He said, "This is because the target in RPJMN remains at the macro level without a clear distinction between the responsibilities of government and non-government institutions."

Another issue was revealed from the interview with a public administration academic, and this was that the development planning forum [Musrenbang] by the local government does not seem to be obligatory, because there is no disincentive or sanction for not conducting the planning forum. She said, "Musrenbang is not mandatory for provincial and local government. When a local government does not conduct the planning forum, this is fine and there is no sanction".

Nevertheless, according to the law concerning the national development planning system, the formulation of a plan should comprise five approaches, i.e. political, technocratic, participatory, top-down, and bottom-up. However, Booth (2005) is unconvinced about whether these various approaches will produce unfavourable outcomes. In response to this, a senior planner in the Ministry of Agrarian Affairs and Spatial Management said, "The key term is agreement and commitment. Yes, there are technocratic processes, analysis of carrying capacity, and so on, but the end product should be based on the agreement of related stakeholders."

4.4 Budgeting System

Before the economic and political crisis in 1998, there was no sufficient legal framework for budgeting in Indonesia. The Indonesian budgeting system was transformed following the crisis which involved a new legal framework for budgeting, a unified and more comprehensive budget, and massive fiscal decentralisation and the empowerment of local governments (OECD, 2009: 6). The discussion in this section is on the relationship between the planning and budgeting systems, budgeting milestones, and budget revision, and it ends by summarising the challenges from Indonesia's budgeting system.

4.4.1 Relations between the Planning and Budgeting Systems

A law regulating the budgeting system was established in 2003,¹³ a year before the planning system law. As discussed earlier, the national development planning system has a close relation with the budgeting process, unlike with spatial planning, especially between the annual planning and budgeting process. This close relation can be seen from the intersection between the development planning and budgeting systems (see Figure 4.7), and is represented by the relation between the annual work plan and the documents of the work and budget plan.¹⁴ However, with many details to be synchronised, the interrelation is technically not as simple as in the chart above.

At the substantial level, Blöndal *et al.* (2009: 12) view close co-operation between the Ministry of Finance and Bappenas as imperative, as the latter is best placed today to advise on sectoral and ministerial priorities. It can be seen from their organisation structure that the National Planning Board maintains close substantive relationships with the various line ministries. For example, Bappenas has separate directors paralleling each government ministry and agency. By contrast, the Directorate-General for the Budget in the Ministry of Finance has three directors that together parallel the rest of the government.

¹³ Law No.17/2003 concerning State Finance.

¹⁴ At national, provincial, and local levels.

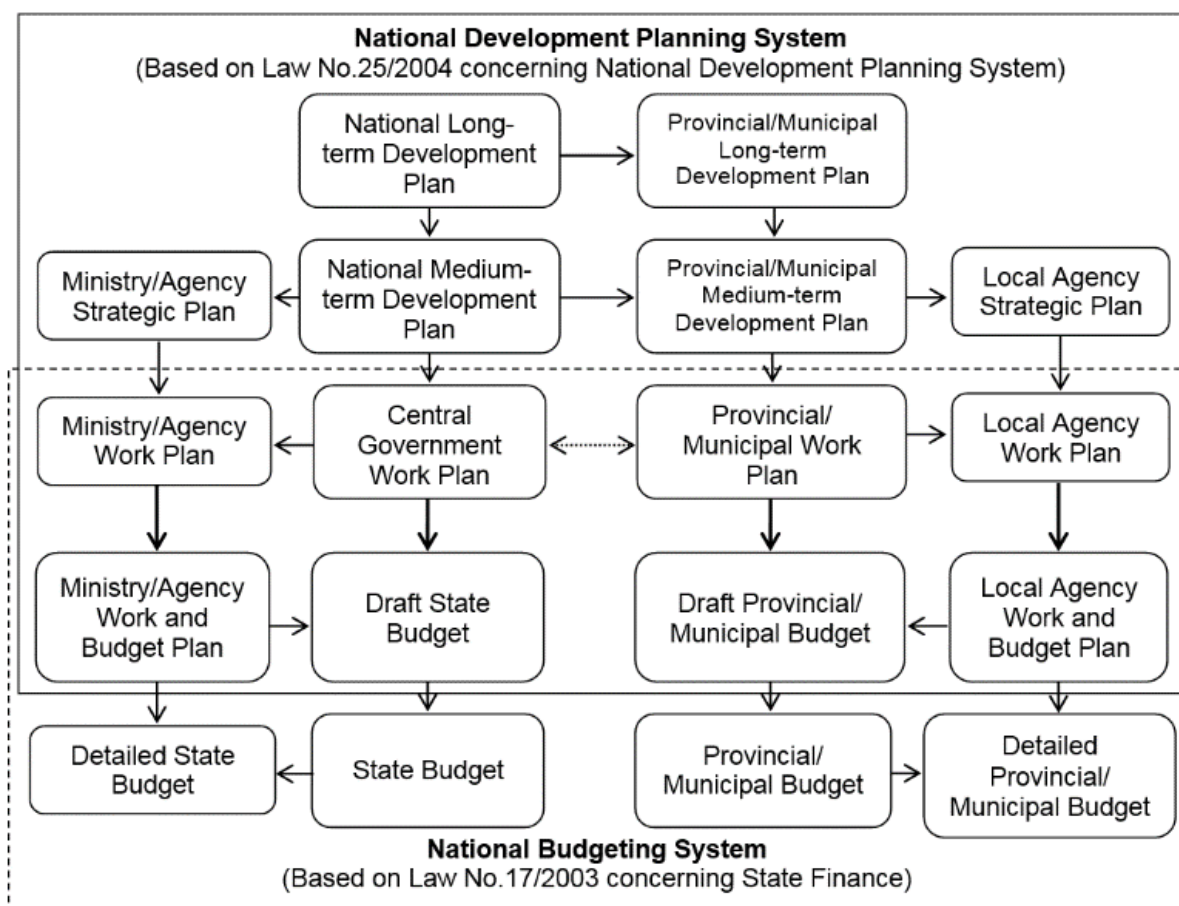


Figure 4.7 Relations between Development Planning and Budgeting Systems

Source: extracted from Gol (2004c) and Gol (2003)

Looking at the separation of the planning and budgeting coordination, Blöndal *et al.* (2009: 22) suggest a reform to unify the structure of the plan and budget to further harmonise the two and remove inefficiencies. Additionally, the synchronisation between planning and budgeting should also be placed in the line ministries, where they have the authority over the plan and budget details.

On a more technical issue, planning and budget documents cannot easily be synchronised. One of the reasons is that both the National Planning Board and Ministry of Finance have supporting information systems which are not fully compatible. This situation has led to difficulty in assessing consistency between planning and budgeting.

4.4.2 Budgeting Milestones

The current State Finances Law details the budgeting processes, mandates specific milestones and dates for the preparation and adoption of the budget, specifies general principles and authorities for the management and accountability of state finances, and establishes the financial relationship between the central government and other

institutions (Blöndal et. al., 2009: 6). The State Budget is determined every year, as can be seen from Figure 4.8.

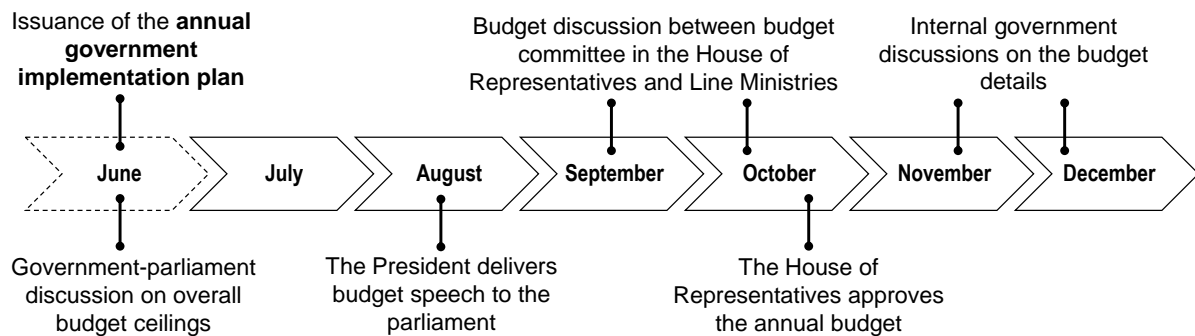


Figure 4.8 Annual Budgeting Milestones

Source: adapted from Blöndal *et al.* (2009: 25–27)

Three budget figures are issued for the line ministries and government agencies and boards, namely the indicative budget ceiling [*pagu indikatif*], the budget ceiling [*pagu anggaran*], and budget allocation [*alokasi anggaran*]. These three types of budget allocation are also addressed in the analysis of the case study, and so it is useful to discuss this here. Moreover, the bureaucratic budgeting process also affects the preparation for implementing a water supply programme.

The calculation for budget allocation starts when the National Planning Board has finished the exercise on the indicative budget ceiling for the annual government work plan [*Rencana Kerja Pemerintah/ RKP*]. This is when they and the Ministry of Finance have preliminary discussions with the Parliament/DPR to discuss the budget ceiling. The budget ceiling remains an indicative budget allocation but with higher certainty, while budget allocation is the final figure. The budget ceiling is used to formulate the annual work and budget plan for each spending unit in the government.

Based on the draft of the annual budget plan from the line ministries, the Ministry of Finance formulates a presidential speech in front of the parliament. This is the start of a more intensive budget discussion between the government and the parliament. After finishing the whole process with the parliament, the discussion continues in the internal government institutions on the detail of the proposed budget from each spending unit within the line ministries. The discussions are usually held between the representatives of the line ministries, the Directorate of the Budget of the Ministry of Finance, and the sectoral directorate from the National Planning Board. The discussions should be finalised in the form of a budget document by the end of December, before the start of the fiscal year on the second day of a new year.

Although the budgeting process is annual, there are discussions on multiyear projects in the internal government. This multiyear set-up is for projects that should be carried out for more than one fiscal year. One of the advantages of a project being set-up on a multiyear basis is a stronger guarantee for the following year's budget allocation. Another advantage is that they only need a one-time procurement process to avoid multiple rounds, which can take 3–4 months each.

4.4.3 Budget Revision

A budget revision is another aspect of budgeting that is necessary to understand for this research because, either in the beginning or when a programme is ongoing, it is likely to affect the need to adjust the scope of work, timeline, and even outputs and outcomes. A budget revision can be classified into two types, namely revisions subject to discussion with parliament, and revisions within the internal government. The former is required when a significant change is needed following a change in macroeconomic assumptions, such as tax revenue or from oil and gas. Blöndal *et al.* (2009) calls this type of revision a mid-year budget revision, which can give rise either to supplementary budgets or budget cuts with significant revisions.

The second type can be done by internal government, without discussion with parliament; these do not lead to a change in current year's budget law. This can be done by shifting some budget allocation from one spending unit to another, but keeping the amount of total budget allocation. This can also be a way to correct unintentional errors in budget details.

4.4.4 Challenges with the Current Budgeting System

One fundamental issue that needs to be addressed is the use of the term 'programme' in the budget document. Budgeting regulations in Indonesia define a programme as merely an aggregate of budget details at one level under a Ministry, a so-called Echelon I unit. This definition is insufficient and counter-productive to encourage budget synchronisation across Echelon I, inter-ministerial, and the level of government. Many programmes, especially for water infrastructure development, are across institutions, and therefore the use of the term 'programme' in budgeting regulations should be altered, for example with the term 'portfolio'.

The definition of a programme in the budgeting document is significantly different than that in the Planning law, which is defined as a policy instrument that contains one or more activities carried out by government agencies/institutions to achieve goals and objectives and obtain budget allocations, or in the form of community activities coordinated by government agencies. This is closer to the definition of the programme used in this research. Moreover, it also accommodates multi-actors and programmes across administrative boundaries.

Similar to the case of planning, a lack of data on actual needs is one of the weaknesses of budgeting exercises. When exercising the indicative budget ceiling [*pagu indikatif*], a senior planner for water supply in the National Planning Board said that they have no proper justification in adjusting programme targets and budget details. She said, "For the annual development plan (which includes the budget ceiling), we receive proposals from line ministries. Afterwards, we adjust. We used to cut the detail in the budget ceiling, although to be honest without proper basic justification. This is because we do not map the real needs and priority levels."

Another challenge is in preparing an inter-government programme. There is no regulation for project officers to sit together during the budgeting process. As a consequence, there is likely to be an unsynchronised budget allocation between projects, which can be in the form that one or more project budget proposal is unallocated or below their prior commitment. Moreover, there are no budgeting tools to bind the budget committee and monitor its realisation.

Another issue concerns the budget cuts that are likely to happen every year, which might threaten on-going projects or programmes and delay the delivery of more services to the people as targeted. New policies, directives, and orders that have to be executed with immediate effect, but without any additional on-top budget allocation, can threaten planned programmes. For example, a director who deals with planning in the Ministry of Public Works and Housing said, "In the last two years, we had to defer our budget allocation for projects which were not there in the Ministerial Strategic Plan. The biggest one was used for constructing and renovating eleven venues for the Asian Games in 2018. We spent Rp2 trillion (\pm £110 million¹⁵) with no additional budget allocation. As a consequence, many strategic targets will not be achieved, including for the water supply sector."

¹⁵ With assumption of £1 = Rp18,000.

4.5 Monitoring and Evaluation System

The planning, implementation, control, and evaluation of the implementation of the plan come under the management function, and these are interrelated and inseparable. The monitoring and evaluation system comprises two activities in controlling development against its plans.

In Indonesia, for government projects or regular operational activities, these are regulated as part of the national development planning system and spatial management. In the current system, the milestones of Indonesia's national development planning consist of four stages, namely (GoI, 2004c):

1. Preparation of plans;
2. Formulation of plans;
3. Control of the implementation of the plan; and
4. Evaluation of the implementation of the plan.

The four areas complement each other by giving feedback and input from one stage to the others. This applies to all sectors, including the water supply sector. Hence, the intention here is to give an overview of the current monitoring and evaluation system and analyse its challenges with a view to a more effective development of the domestic water supply.

4.5.1 Monitoring and Evaluation in the Development Planning System

According to the law on the planning system, the aim of monitoring, controlling, and evaluating is to improve both the efficiency and effectiveness of resource allocation, and transparency and accountability. This Section identifies challenges from the current regulations as discussed below.

Monitoring as a Part of Development Control

Development control is defined by the law on planning systems as a series of management activities intended to ensure that a programme/activity is carried out by the plan (GoI, 2004c). Monitoring, as part of development control, is defined as the act of observing the progress of the implementation of the development plan, identifying, and anticipating problems that arise and will arise for action as early as possible.

The above definition of monitoring is an ideal one. However, a supervisor for monitoring and evaluation in the Ministry of Public Works and Housing¹⁶ said, “The current electronic evaluation and monitoring system remains the same as before you [myself as the researcher] went to study your PhD. It remains focused on the progress of physical or construction works and budget disbursement.” There is less attention to the mandate in identifying and anticipating a more qualitative progress.

Based on the current regulations, a follow-up is undertaken based on the results of the implementation to ensure that the implementation of projects or activities is in-line with the formulated plans and other current regulations. The purpose of the follow-up action is to make corrections to irregularities, accelerate delays in implementation, or clarify unclear implementation of the plan. Again, the follow-up still focuses on how to speed up progress. In this regard, the supervisor added, “We do a follow-up. We focus on reminding spending units, especially the ones who have a big budget allocation. We call them decisive spending units [*satuan kerja penentu*] since their progress affects progress at the ministry level.”

Evaluation

According to the law, evaluation is defined as a series of activities comparing the realisation of inputs, outputs, and outcomes to plans and standards. Evaluation is conducted to know whether the achievement of results, progress, and constraints encountered in the implementation of the development plan can be assessed and studied to improve it for future purposes.

The main focus of evaluation in the national development planning system is on the outputs, outcomes, and impacts of the implementation of the development plan. From the timeline, evaluation activities should be carried out at various stages, namely *ex-ante*, on-going, and *ex-post* evaluation (Gol, 2006). Evaluation in the planning stage (*ex-ante*) is carried out before the establishment of a development plan, to select and determine the priority scale of various alternatives and the possibility of how to achieve the objectives previously formulated. Evaluation of the implementation stage (on-going) is carried out during the implementation of the development plan to determine the level of progress compared to the predetermined plan.

¹⁶ Under the Bureau of Budget Planning and International Cooperation.

Evaluation in the post-implementation phase (*ex-post*) is carried out after the plan has been completed and is directed to see whether the achievement (output/outcome/impact) of the programme can overcome any development problems that need to be solved. This evaluation is used to assess the efficiency (outputs and outcomes versus inputs), effectiveness (results and impacts on targets), or benefits (impacts on needs) of a programme.

Similar to monitoring with its focus on the quantitative aspect, evaluation in Indonesia also tend to be the same. It is not easy to do a qualitative evaluation, especially for the outcomes of a programme. A public administration academic in Bandung said, "One of the difficulties is because the logic is frequently not formulated in order. For example, there is programme x, with output y, and impact z. The difficulty is ensuring that output y and impact z actually results from programme x."

Reporting

Reporting is carried out to provide stakeholders with quick and accurate information as material for making decisions following the conditions that occur, as well as determining relevant policies. Reporting activities in the national development planning system are carried out periodically and in the hierarchy.

Periodic reporting occurs every three months (quarterly), six months (semester), or annually. In a hierarchy, the report starts from one lower unit of the organisation to the top of the organisation's leadership. Hierarchical also means from one level of government to a higher level of government, for example from regency/city to province and then to national level in aggregate.

Reporting must also be done to the community, both actively and passively. Active reporting means that each organisational unit disseminates information to the broader community in print or electronically, while passive reporting is where every organisation develops a medium for disseminating information through information sites, so that it can be accessed by the wider community.

In order to get results that can provide useful information, an adequate form of reporting format is needed. This must accommodate relevant information so that it can provide adequate instructions or information to be addressed and take corrective action, or for the formulation of the next period of planning.

Reporting is only the means of regulation done by the monitoring and evaluation system. Since the system focuses on quantitative matters, the development of the supporting system is more on quantitative figures. An official from the water supply division in West Java Province said, "There is no established system for monitoring and evaluation. People from the central government are simply asking about the progress by telephone or text."

4.5.2 Monitoring and Evaluation in Spatial Planning System

While the national development planning system uses the term development control, the spatial planning system is more familiar with the term 'supervision'. Supervision in the latter consists of monitoring, evaluation, and reporting actions and is a general method for all sectors, including the water supply sector.

The law mandates that supervision is carried out by the respective authority at central government, provincial, and local levels and involves the role of the community. The community's role can be in the form of submitting reports and complaints to the government. In the case of irregularities in the implementation of spatial planning, parties who commit irregularities can be subject to sanctions.

Monitoring, according to the law on spatial management, is defined as an act of observing the implementation of spatial planning directly, indirectly, and through community reports. Evaluation assesses the level of achievement of measurable and objective spatial planning, and these activities are supported by reporting in delivering evaluation results.

Since water infrastructure, i.e. pipeline networks, is most likely not included in spatial planning documents, its monitoring and evaluation based on the spatial plan are unlikely. In fact, in practice, spatial conflict over different land use is likely to happen in the field which needs to be monitored and evaluated. This also happened in the development of the water infrastructure for the South System in Metropolitan Bandung, which will be discussed in detail in the next chapter.

4.5.3 Challenges with the Monitoring and Evaluation System

As discussed earlier, the definition of monitoring and evaluation is already ideal for effective development control. However, there are challenges in the fact that the current monitoring system has led to a greater focus on quantitative progress. It is specifically a challenge for spending units in the water supply sector which are likely

to have a lower budget rather than those for highway development. As a consequence, spending units with smaller budget allocation gain less attention from monitoring than the larger ones.

The current system also focuses on aggregate at a national or ministry level. Therefore, the system does not cover the needs of programme monitoring, control, and evaluation, which can help monitor the implementation of related projects in real time. Accordingly, a new information system for programme monitoring and evaluation needs to be established. From personal experience, online reporting would be more efficient, notably for dynamic changes such as a construction programme.

Another challenge is to include the spatial aspect of the planned monitoring and evaluation system. For this issue, the electronic monitoring and evaluation system in the Ministry of Public Works and Housing has started to include this, by providing construction photos showing work progress with specific geographic coordinates. Therefore, someone from Jakarta, for example, can see the latest construction progress in Bandung. This is a good start for establishing a more comprehensive information system in the context of a programme.

4.6 National Issues, Policies, and Strategies for Water Supply Development

After discussing the national governance and government system, it is also beneficial to understand national policies and strategies for water supply development in Indonesia. National policies, translated into more detailed regulations, have affected water supply development at regional, provincial, and local levels.

This section starts with the issues and challenges with water supply development nationally, followed by a discussion on national policies, strategies, and organisations at the national level, and the needs of the regional system to be applied widely in Indonesia.

4.6.1 National Issues on Water Supply Infrastructure Development

McCawley (2015: 278) says that policymakers in Indonesia have rarely been prepared to address community expectations about the supply of infrastructure services, and this also happens in the water sector. Some issues constraining the development of the domestic water supply are highlighted in the discussion below.

Limited Coverage of Safe Water

Ray and Ing (2016) say that Indonesia continues to underperform in delivering drinking water to households. One of the problems in accelerating water provision is from the natural side as Indonesia, nationally, faced a shortage of untreated water of 128,000 litres/second in 2016, and it is projected that only 50% will be met by 2019 (Directorate of Water Supply, 2016). The significance of this shortage varies from one region to another. Moreover, many water companies [*Perusahaan Daerah Air Minum/ PDAM*], as the primary providers of the safe water supply, are struggling with particular problems. Ray and Ing (2016) found that water companies generally suffer from poor governance and under-investment, given that 73% of PDAMs run at a loss, with average tariffs lower than unit costs. For this reason, just under 50% of PDAMs are classified by the government as financially unhealthy, and this underperformance risks the service delivery of safe potable water.

Political Will at the Local Government Level

All of the above problems are worsened by limited commitment from the local governments. One of the indicators of this is that less than 10% of local governments' budget is allocated for domestic water supply development (Directorate of Water Supply, 2016). In fact, in the current decentralisation era, the provision of domestic water supply is part of the responsibility of the local government, although the central and provincial governments can help achieve a minimum service when the system is across more than one city or regency (Antono, 2018).

This unwillingness occurs not only during the execution of a programme; it can also be seen in the local governments' unwillingness to formulate a master plan for the water supply system [*Rencana Induk Sistem Penyediaan Air Minum/ RISPAM*] in their respective administrative area. This master plan is requested by the Ministry of Public Works and Housing and is a requirement to receive a supporting programme from the ministry.

Not all the local and provincial governments are ready with their RISPAM. Technical planning staff from the Directorate of Water Supply¹⁷ said, "Currently, of 500 plus regencies and cities, fewer than 100 have a legalised master plan for water supply development. We keep pushing the local and provincial governments."

¹⁷ Under the Ministry of Public Works and Housing.

However, there are also local governments which pay close attention to water supply development, and these governments usually receive more attention for support and other incentives from the central government. Nevertheless, the central government should also think about how to make the less attentive local governments prioritise domestic water sector more.

Financial Issues

Ray and Ing (2016) note that funds from the government will be insufficient to provide an additional 27.7 million household connections in 2019, as targeted. Moreover, the participation of the private sector in the water sector is now limited after the Constitutional Court's decision not to encourage the commercialisation of water resources at the full expense of the people.

These changes in budget allocation can also create problems for the certainty of the planned and ongoing programmes. As described earlier in Section 4.4, a budget revision can happen in the middle of the fiscal year. One of these types of revision is a budget cut, rather than a supplementary budget, usually because of the inevitable underperformance of the national income in the on-going year.

From the outside view, the Ministry of Public Works and Housing seems to struggle to justify which local governments should get support due to unclear criteria in arranging priorities. A planner in the National Planning Board said, "There are proposals from local governments that have been completed with all the requirements but they could not get any financial or programme support. However, other local governments with a master plan that has not been legalised, as one of the requirements, were given assistance."

4.6.2 National Target and Policies

In order to address the above issues, various policies, strategies, and new targets are now being established. The discussion starts with the target, followed by three strategies to achieve the target.

'100-0-100' Target

In response to an attempt to accelerate water supply provision, an ambitious target was set in the National Medium-Term Development Plan (NMTDP) 2015-2019 to achieve 100% of safe water services by 2019. This comes under the jargon of the '100-

0-100' target, which means delivering 100% access to safe water, 0% slums, and 100% access to safe sanitation by 2019.

Ray and Ing (2016) found that to achieve the target on time, the government needed to almost double the current number of household connections. This target seems unlikely to be achieved looking at the growth of in household connections, which was only 4.5% annually in the last five years, but to reach the target in 2019 would require an average increase of 7.5% per year (Antono, 2018).

Regardless of whether this target will be achieved on time in 2019, Antono (2018) said, "The point is to make an effort to provide safe potable water for all as the top priority by all levels of government and should be managed in the best possible way. All resources must be synergised to stand together to deliver this essential service."

Optimising the Existing System

Two issues need to be addressed related to the existing systems, namely decreasing idle capacity¹⁸ and Non-Revenue Water (NRW). Figures from the Directorate of Water Supply (2016: 5) show that there is idle capacity 38,000 litres/second which can potentially serve ±3.8 million more housing connections, although the NRW reaches 33% nationally from the targeted amount of 20% on average. The government believes this category to be a 'quick win' programme compared to the new development of an infrastructure system which will use more budget allocation and time. Moreover, the accomplishment of this effort will make a significant improvement, considering the significant amount of potential treated water that has not been utilised or leaked along the way to households.

Besides improving the utilisation of idle capacity, reducing and controlling NRW is also a big challenge for water companies. Those in developing countries are struggling to ensure that customers receive a reasonable supply of safe drinking water due to inadequate pipeline networks, with weak record systems, and a low level of technical skills and technology (Farley *et al.*, 2008). In fact, by reducing water losses, water utilities have an instant additional supply to expand services to underserved or uncovered areas.

¹⁸ Amount of water that has not been channelled to, and utilised by, end users.

New Developments

Besides optimising the existing system, the government and water companies continue to invest in constructing new water infrastructure systems. Building a regional (across provinces) water supply system, as the case study for this research, falls into this category. This new development might mean building a massive infrastructure system, such as the regional system, and smaller urban and rural systems. On their smallest scale, these would be in sub-districts or villages and would also encourage local participation. The building of a non-piped water supply system would also be recommended. The government has a duty to ensure that all the systems produce safe drinking water.

A non-piped water supply is a unified physical (technical) and non-physical system of individual and public water infrastructure and facilities with or without limited and simple pipelines. Module options include spring protection, individual household filters, a deep well, public hydrant, water tank, hand pump well, rainwater shelter, water terminal, and other simple drinking water treatment plants.

Advisory services

Advisory services [Indonesian: *pembinaan*] from the central government to provincial and local government intensified after the implementation of decentralisation. Since most of the physical development for water infrastructure shifted to the local government, the primary function and responsibility of the central government has shifted more to ensuring that the sectoral planning process, and its engineering designs and constructions, are appropriately conducted.

The advisory service is also there to revitalise water companies categorised by the government as unhealthy, in terms of its finance and governance. These water companies are usually constrained by bureaucratic controls and enforced low prices (McCawley, 2015). Therefore, the advisory service covers financial assistance and improves the company's good governance internally, and also to the local government as the owner.

The expected result from this advisory service is to have water companies, in collaboration with the local government, which can provide reliable water services to customers. Advice may seek to improve the physical infrastructure by improving and sustaining the functions of both existing and newly developed infrastructure systems.

4.6.3 National Strategy

In 2013, the Minister of Public Works issued a regulation regarding the National Policy and Strategy for the Development of Water Supply System for the whole country. Based on this regulation, provincial and local governments are required to formulate policies, strategies, and programmes. This formulation should involve all stakeholders and delivery institutions in the form of a public consultation. The policy and strategy document should include a strategic plan and development programme, which includes (MoPWH, 2013):

- a. Identify potentially untreated water for intended service areas and utilise it;
- b. Divide the administrative area into one or more service areas according to the potential of untreated water and the Spatial Plan, for both the service area with the pipeline network and non-pipeline network;
- c. Indicate development programmes for each service area that has been sorted based on priority order;
- d. Formulate criteria and service standards in the administrative area of the regency or city;
- e. Calculate indicative finance and investment requirements for service areas that are considered strategic and growth centres; and
- f. Indicate required institutional development for service areas that are considered strategic and growth centres.

The need to develop a water supply system under regional cooperation has been emphasised in this ministerial regulation. The national strategy mentions that in the implementation of water sector development and sanitation infrastructure, the provincial and local governments must prioritise regional cooperation.

The policy and strategy also places attention to the improvement of related institutional capacity, especially in establishing regional cooperation. Some challenges should be appropriately managed, such as the division of working scope, obligations and rights, and when appointing operational management.

4.6.4 The Need for a Regional Water Supply System

Developing a regional water supply system is inevitable for certain regions, usually because of the lack of water resources or an imbalance in resources of untreated water that cannot be provided to the administrative area of a city or regency. The role of the provincial government here, supported by the central government, is vital due to potential conflict between the local governments involved.

Imbalance in Resources of Untreated Water

There are two issues regarding the imbalance in resources of untreated water (Antono, 2018). Firstly, one region might lack water resources while another has an adequate supply. Secondly, there are local governments that have lost their water resources due to a split administration area and the impact of increased demand for regional autonomy. For both issues, the only option is to channel untreated water from regions with more untreated water to needier ones. However, it can be difficult to distribute the water, at least from the geographical, technical and political perspectives. Indonesia, as an archipelagic country, has more challenges in this regard.

Moreover, it is worsened by the negative impact of regional autonomy. Firman (2009: 149) states that the parochialism of many local governments has caused problems in services which require cross-border cooperation, including solid waste management and water supply, in many regions in Indonesia. This might lead to a potential conflict where the 'owner' of the untreated water is unwilling to share their natural resource. Therefore, the role of the provincial and central government in refereeing these conflicts is vital.

Lewis (2017) examined the impact of the created local government on water access and found that the establishment of new local governments has negatively affected water access, where new districts provide reduced access to infrastructure services compared to original local governments. This specific result suggests that the creation of new districts leads to about a 1% decline in household access to protected water and sanitation in year two, relative to original districts, or it can be said that there is a lag of one year. It also seems plausible to argue that newly created districts may generally be less well governed than original districts.

Readiness Requirements

The government expects particular benefits from the establishment of the regional water supply system, not only to provide water for all but also to contribute to the efficiency of the investment in and financing of the operation of the system, as well as to increase economies of scale to attract external financial sources (Antono, 2018).

Considering that the significant investment for most of the regional infrastructure system needs support from central and provincial government, the central government has so-called readiness requirements for provincial and local government to receive support from the central government, as follows (MoPWH, 2016):

1. Master Plan for Water Supply Development System [*Rencana Induk Pengembangan Sistem Air Minum/ RISPAM*];
2. Medium-Term Investment Programme Plan [*Rencana Program Investasi Jangka Menengah/ RPIJM*];
3. Feasibility Study, including technical justification and its costs;
4. Detailed Engineering Design (DED);
5. Permit for Utilising Surface Water [*Surat Ijin Penggunaan dan Pemanfaatan Air Permukaan/ SIPPA*] from Directorate General of Water Resources, Ministry of Public Works and Housing or local agency dealing with water resources;
6. Availability of land, when necessary, stated in a guarantee letter;
7. Availability of funds from the local/provincial government for joint affairs [*Dana Daerah untuk Urusan Bersama/ DDUB*];
8. Appointment of a managing institution for the new system, whether the existing water company, community, or other entities;
9. Availability of the above requirements declared by the head of government (governor/mayor/regent).

Considering the complexity of building the regional system and in order to ensure that the preparation and execution of the regional system is appropriately conducted, there are more specific documents that need to be prepared before the projects are executed (MoPWH, 2016):

1. Memorandum of Understanding [*Kesepakatan Bersama/ KSB*] between the provincial government, regency or city government, and the central government;
2. Cooperation Agreement [*Perjanjian Kerjasama/ PKS*] between the provincial government, regency or city government, and the central government;
3. Specific Master Plan for Regional Water Supply Development System [*Rencana Induk Sistem Pengembangan Air Minum/ RISPAM*], legalised by the provincial and central government;
4. Specific feasibility study for the regional water infrastructure system;
5. Specific DED for the upstream system (water intake to off-take) and downstream (distribution and services channel);

6. Analysis of environmental impacts [*Analisa Mengenai Dampak Lingkungan/ Amdal*];
7. Permit for Utilising Surface Water [*Surat Ijin Penggunaan dan Pemanfaatan Air Permukaan/ SIPPA*].

All these lists of readiness requirements are important to understand for this research. Their presence and content in respect of the regional development in Metropolitan Bandung are analysed in the next chapter.

4.7 Organisations Involved in the Water Supply Sector

Various institutions are involved, directly or indirectly, with the development of a water supply system, including line ministries at the central, provincial and local government levels, and water supply companies. Table 5.1 summarises the roles of the respective institutions on planning and formulating regulation, financing, construction and operation, improving people's awareness, and building government capacity.

Table 4.1 Roles of Organisations Involved in the Water Supply Sector

No.	Institution	Planning/ Regulation	Financing	Construc- tion	Main- tenance	People's Awareness	Capacity Building
1.	Directorate General of Water Resources, MoPWH	✓	✓	✓			✓
2.	Directorate General of Human Settlements, MoPWH	✓	✓	✓		✓	✓
3.	National Planning Board	✓	✓				✓
4.	Ministry of Agrarian and Spatial Management	✓					✓
5.	Ministry of Finance		✓				
6.	Ministry of Home Affairs	✓					✓
7.	Ministry of Health					✓	
8.	Ministry of Environment	✓	✓			✓	✓
9.	Ministry of Education and Culture					✓	
10.	Ministry of Religion Affairs					✓	
11.	Ministry of Villages	✓	✓				✓
12.	Provincial Government	✓	✓	✓			✓
13.	Local (City/ Regency) Government	✓	✓	✓		✓	
14.	Water Companies	✓	✓	✓	✓		
15.	Special Operators for Regional Water Supply Systems				✓		

4.7.1 Ministry of Public Works and Housing (MoPWH)

Two Directorate Generals under the MoPWH have vital roles in the development of the water supply in Indonesia, namely Directorate General of Water Resources (DGWR) and Directorate General of Human Settlements (DGHS). The former deals with the provision of untreated water and has many more roles in providing and managing water resources for other purposes. The latter institution deals much more with water supply development.

The Directorate General of Human Settlements used to build all the water systems in Indonesia, alongside the water companies, before the decentralisation era. After decentralisation and the authority for building the water infrastructure system shifted to local government, the DGHS selected more strategic systems that they support every year. The regional water supply system is one of the strategic programmes that usually receives support from the directorate general.

After decentralisation, more regulations and guidelines were formulated by the DGHS to improve the quantity of water supply and the quality of the governance by the provincial and local government and water companies. This was both for building large systems, and so that the DGHS could run a programme that involves people's participation in the selected area, in the hope to be replicated by local governments.

4.7.2 National Planning Board

As indicated by its name, the National Planning Board [*Badan Perencanaan Pembangunan Nasional/ Bappenas*] prepares national development plans, helps prepare the draft state budget, and conducts monitoring and evaluation of the implementation of the development plan. The working unit under Bappenas that deals with water supply is the Directorate of Urban, Housing, and Human Settlements (DUHHS). The DUHHS coordinates, formulates and implements policies, and monitors, evaluates, and controls national development planning for drinking water with another sector at the national level. They also have the task of developing provincial and local planning boards.

In conducting this task, the board initiated the establishment of a Water and Environmental Sanitation Working Group [*Kelompok Kerja Air Minum dan Penyehatan Lingkungan/ Pokja AMPL*] in all provincial and local governments. The Working Group is an ad-hoc institution formed in 1997 as a forum for communication and coordination so that the development of drinking water and sanitation works at its best, starting from

the planning, implementation, monitoring and evaluation stages. Also, the formation of the Working Group at all levels aims to improve coordination among government institutions that are the actors of water and sanitation development.

The National Working Group also functions as a driving force for advocacy and synergy in water and sanitation development in Indonesia. The existence of the National Working Group is expected to strengthen coordination and synergy between the actors in the development of the water and sanitation sector to achieve the development targets.

4.7.3 Ministry of Agrarian Affairs and Spatial Management

The role of the Ministry of Agrarian and Spatial Management in the water sector is in the formulation of laws and regulations in spatial planning, especially the detail of spatial structure as the backbone of a region. It is conducted by the Directorate General of Spatial Management [*Penataan Ruang*] under the ministry.

Another vital role of the ministry is in giving substantial approval [*persetujuan substans]* for spatial plans at provincial and city/regency level. Approval of substance is an agreement given by the minister, who states that the draft regulation of a proposed spatial plan has referred to the spatial planning laws, regulations, and national policy, and that it follows the hierarchy of spatial planning. In this role, it is expected that water resources are more protected from any negative impact of other uses.

4.7.4 Ministry of Finance

The current role of the Ministry of Finance is not merely budget allocation for proposed programmes or projects; it also has the right to question the efficiency of the proposed allocation. At the aggregate level nationally, personnel from the Ministry of Finance accompanied by the National Planning Board look at the budget plans from line ministries at a meeting which is held at least twice during the planning and budgeting process.

Besides allocating the budget, the Ministry of Finance has the authority to hold the proposed budget revision for priority programmes that imply a reduction in the national target. As part of priority programmes, the development of regional domestic water supply has this advantage, while proposed budget revisions for spending units, especially for reducing allocations, go through a great deal of screening to ensure the allocated budget is in line with efforts to achieve the national target.

4.7.5 Ministry of Villages, Development of Developing Regions, and Transmigration

This ministry is more familiar with its nickname as the Ministry of Villages. It is a new ministry in the current administration established to improve development management of village governments, following the launch of the Law regarding Villages in 2014. The law gives more autonomy and authority, coupled with the village fund. The Ministry of Villages has made clean water a priority sector. Many of the villages have utilised their fund for the provision of clean water at the village scale. As such, this is another potential source of support for the achievement of the national target for 100% access to safe potable water as soon as possible.

Ministry of Home Affairs

The role of the Ministry of Home Affairs is linked more to capacity building of provincial and local government personnel, and governance in general. Additionally, together with the Ministry of Villages, the Ministry of Home Affairs develops the capacity of village governments, including the management unit for water supply and sanitation facilities [*Badan Pengelola Sarana Penyediaan Air Minum dan Sanitasi/ BPSPAMS*].

In support of the water sector programme, the Ministry of Home Affairs may be asked to remind provincial and local government to fulfil their task, for instance in providing the required land. This can be done during planning and budgeting, and in the on-going fiscal year. Furthermore, the Ministry of Home Affairs also has a domain in synchronising regional and local government regulations with other laws and regulations, and to make sure that all the regulations do not hinder the development of the water sector.

Other Ministries for Improving People's Awareness

Other ministries have essential roles in water sector development although they do not conduct physical development. These are the Ministries of Health, Education and Culture, and Religious Affairs. Their main roles are to improve awareness, including among children, of the need to use water wisely, and to ensure that the provision of water at schools is adequate.

Provincial Government

The roles of provincial governments have become more important in the decentralisation era. They bridge central and local governments by translating national policies and targets to the local condition and vice versa by informing on local needs.

For the development of a regional water supply system across more than one local administration, but within a province, the provincial government has a large role. It coordinates two or more local governments, maintains good coordination with the central government, conducts tasks for construction, and arranges the operator of the regional system, among others.

Local (City/Regency) Government and Water Companies

In the era of decentralisation and regional autonomy, the domain of water supply development is in the hands of local government, after long periods conducted centrally by the central government. Most local governments own a water company as a local government enterprise. Although most services are provided by water companies, local government should be aware of their tasks in addressing people's need for water, and indeed water companies are merely the executor of the local government's direction.

Special Operator for Regional Water Supply System

This is an independent institution needed to operate a regional water supply system. For a system across two or more local administration areas within a province, the provincial government should prepare or appoint an operator.¹⁹ However, for a system covering two or more provinces, the central government should perform this role. The main task of the special operator is to ensure the functionality of the system and sustainability of the services. Other possible roles are the coordination of related provincial and local government agencies, maintaining cooperation with other business entities, formulating guidelines and standard operating procedures for running the system, and so on.

¹⁹ This can be in a form of an enterprise owned by provincial government.

4.8 Conclusion

The discussion in this chapter has outlined challenges that potentially affect water supply development and other sectors in general. The shifting government system from centralised to decentralised has been the main cause of the other changes in systems such as the planning and budgeting system.

The decentralised government system demands more coordination between stakeholders. Since the water supply is the domain of local government, their political will is essential to win support from the provincial and central government. They should be ready to present the exact need and readiness requirements to develop either a new system or expand the existing one.

Although the decentralised system brought challenges, there are potential benefits from the decentralised system. The benefits include a closer range of people from the government so that the problems and needs can be identified and anticipated in the first instance. The decentralised system also aims to improve the capacity of local governments to serve local communities.

The challenges from planning, budgeting, monitoring, and evaluation systems are linked more to the technical system because the spirit and aim of these systems, based on the respective laws, are already ideal for achieving effective and efficient development. The earlier discussion revealed that the primary challenges are from bureaucratic processes in the parliament and the process within the government, and the information system utilised in the context of a programme across institutions is not fully supported.

The previous extensive discussions on the national system in this chapter reveal some components of the national system that are of relevance to the case study and some other indirect influence on the development of water supply. The level of relevancies is summarised in Table 4.2.

More specific for the spatial planning system, the component that is closely relevant to water supply development is on the spatial structure map to indicate the arrangement of infrastructure networks. However, due to the scale, water supply infrastructure can only be accommodated in spatial city plan and for the more detail areas.

Table 4.2 Relevance of the National System to Water Supply Development

No.	Components	Relevance		Notes
		Direct	Indirect	
1.	Decentralised government system	✓		Affecting segregation of authority in constructing water supply infrastructure system
2.	Political system		✓	It is related to the national budgeting process. Constitutional Court limits the involvement of the private sector.
3.	Development Planning System	✓		To obtain the government's budget allocation, an ongoing or future programme should be specifically stated in all development planning documents.
4.	Spatial Planning System	✓		The water supply system is drawn at the city level and more detail areas. From 2018, the regional system (across local government) must be included in the provincial spatial plan.
5.	Budgeting System	✓		Budget allocation should be ensured to run the ongoing or for the future programme/projects.
6.	Monitoring and Evaluation System		✓	The required reports at this time merely focused on a national aggregate and less attention on a specific programme or projects.

Consequently, numerous water supply systems are not included in the spatial plans, such as for the case research of the south system of regional water supply for Bandung City. Fortunately, a regulation from the Ministry of Agrarian Affairs and Spatial Management in early 2018 requires the regional water system to be incorporated in provincial spatial plans.

Since water supply infrastructure is not included in the national spatial map, this can be a threat in allocating the budget. A programme included in a spatial plan will have a stronger justification and a higher chance for the central government to allocate their budget to the desired programme. In anticipation to this case, the appointed organisation unit must ensure that the planned programme has been detailed in the related development planning document, especially the annual development plan that has the closest relation to the budgeting process.

From the above discussion, it appears that the national systems need to be adjusted to support the urgent development of water supply fully. However, the change of the national system will need a massive effort and take a very long time to complete. Moreover, the changes in the national system need thorough research, proper planning and preparation, and sensible execution to avoid different negative implications. Therefore, this research tends to use a more pragmatic approach to adapt to the current national system.

Nevertheless, policies and strategies developed by the Ministry of Public Works and Housing are clear with the primary aim to achieve 100% safe potable water for all households in Indonesia. The above challenges should be addressed and adapted while formulating plans, preparing all the readiness requirements, and establishing an efficient system for the development of the regional water supply in Indonesia.

The discussion in this chapter will be used to analyse the case study in the next chapter. It confirms whether the development in Metropolitan Bandung faces similar challenges, as identified in this chapter. The analysis of the case study not only looks at a particular year but also uses data spanning ten years from the time the development of the regional development was initiated until the whole system is established.

This page is intentionally left blank

CHAPTER 5
ANALYSIS OF THE REGIONAL WATER
SUPPLY DEVELOPMENT FOR
BANDUNG CITY

CHAPTER 5 ANALYSIS OF THE REGIONAL WATER SUPPLY DEVELOPMENT FOR BANDUNG CITY

5.1	Introduction	155
5.2	Geographical Scope of the Regional Water Supply	157
5.2.1	Metropolitan Bandung	157
5.2.2	Bandung City.....	159
	<i>Administrative Boundaries</i>	159
	<i>Level of Service from Bandung City Water Company</i>	159
5.3	Regional Water Supply System in Metropolitan Bandung.....	161
5.3.1	The Regional System	161
	<i>Hydrology in Metropolitan Bandung</i>	162
	<i>Overview of the Regional Water Infrastructure System</i>	162
	<i>Development of the South System: The Case Focus</i>	163
5.3.2	Expected Benefit for Bandung City.....	164
5.4	Programme Preparation	165
5.4.1	Initiation.....	165
5.4.2	Needs Assessment	166
5.4.3	Policy	167
5.4.4	Spatial Planning	168
5.4.5	Development Planning	171
5.4.6	Draft Master Plan for the Water Supply System	174
5.4.7	Feasibility Study	175
5.4.8	Programming.....	176
5.4.9	Budgeting.....	182
5.5	Programme Implementation	183
5.5.1	The Infrastructure System	183
5.5.2	Timeline for Construction Projects.....	184
5.5.3	Detailed Engineering Design	186
5.5.4	Raw/Untreated Water Unit.....	187
5.5.5	Water Production Unit	188
5.5.6	Main Distribution	188
5.5.7	Branch Distribution and Service Unit	189
5.5.8	Appointment of Operating Management	190
5.5.9	Monitoring, Control, and Evaluation.....	190
5.6	Analysis of Organisational Structure	191
5.7	Conclusion	193

5.1 Introduction

This chapter discusses the overall development of the South System of regional water supply infrastructure in Metropolitan Bandung, specifically which serves Bandung City.²⁰ As outlined in the research question, this chapter focuses on the programme organisational processes and organisational structure of the water supply development. Specifically, the discussion in this chapter is aimed at attaining the second objective of this research to identify challenges facing the current water supply development system in Metropolitan Bandung.

The discussion is divided into two main sections, namely programme preparation and programme implementation. This chapter starts by describing an overview of the geographical characteristics of the study area and the overall regional system for Metropolitan Bandung. The discussion concludes with an elaboration on the structure and roles of involved organisations.

5.2 Geographical Scope of the Regional Water Supply

This section shows the position of and geographical information on Metropolitan Bandung and Bandung City within Indonesia and Java Island. It starts by giving an overview of Indonesia and Java Island where Metropolitan Bandung is situated. It is followed by information on its boundaries, and which cities and districts are included in the Metropolitan Region. There is also a discussion on the division of districts in Bandung City, as the basis for analysing the current service coverage from the local Bandung City Water Company.

5.2.1 Metropolitan Bandung

In Indonesia, an urban region can be titled a metropolitan area when it has a population of at least one million.²¹ With an area of 3,313 km², the total population in Metropolitan Bandung reached 8.3 million people in 2016 (Jupri and Mulyadi, 2017).

Metropolitan Bandung is situated in West Java Province on Java Island, in southern Indonesia. The inserted maps in Figure 5.1 shows Java Island in the territory of Indonesia and the position of Metropolitan Bandung in West Java Province.

²⁰ The South System also serves Bandung Regency.

²¹ Presidential Regulation 2018 concerning regarding Spatial Plan of Bandung Basin Urban Area.

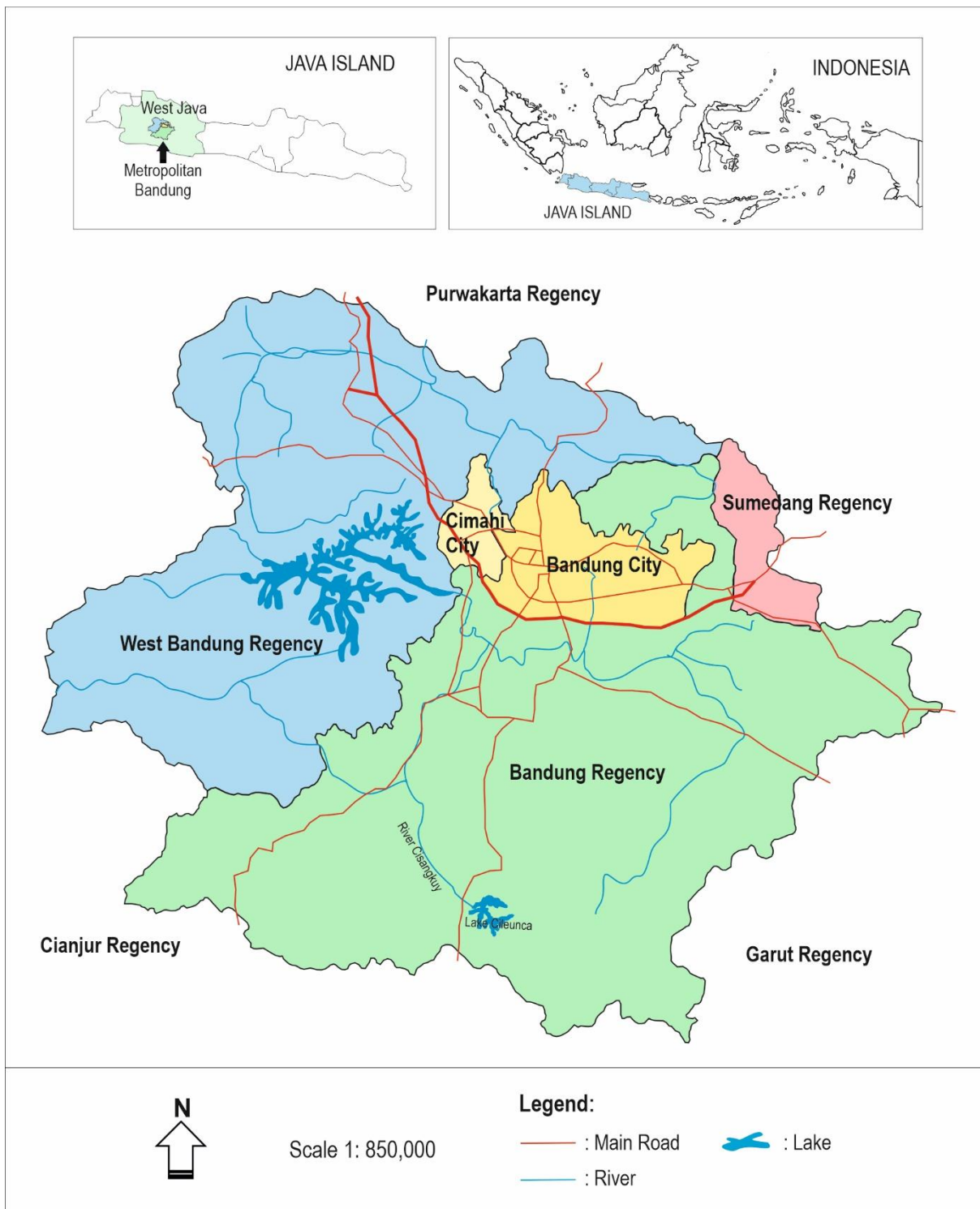


Figure 5.1 Map of Metropolitan Bandung

Source: adapted from Jupri and Mulyadi (2017: 34)

Metropolitan Bandung consists of Bandung City, Cimahi City, Bandung Regency, West Bandung Regency, and two districts of Sumedang Regency (see Figure 5.1). The metropolitan region is also known as the Bandung Basin Region because the region is surrounded by hills and mountains and appears like a huge basin. Since the metropolitan area is based on a functional urban area rather than administrative boundaries, it is likely that the metropolitan area will continue to grow larger.

5.2.2 Bandung City

Administrative Boundaries

At the lower level of administrative division, Bandung City has 30 districts [*kecamatan*] (see Figure 5.2). According to the Bandung City Statistical Bureau (2018), the total population of Bandung City was expected to be almost 2.5 million in 2016. With a total area of 16,730 ha, the population density of Bandung is about 150 people/ hectare, and is the second densest city in Indonesia after Jakarta. The annual growth rate of the population in Bandung City from 2011–2016 was 0.5%.

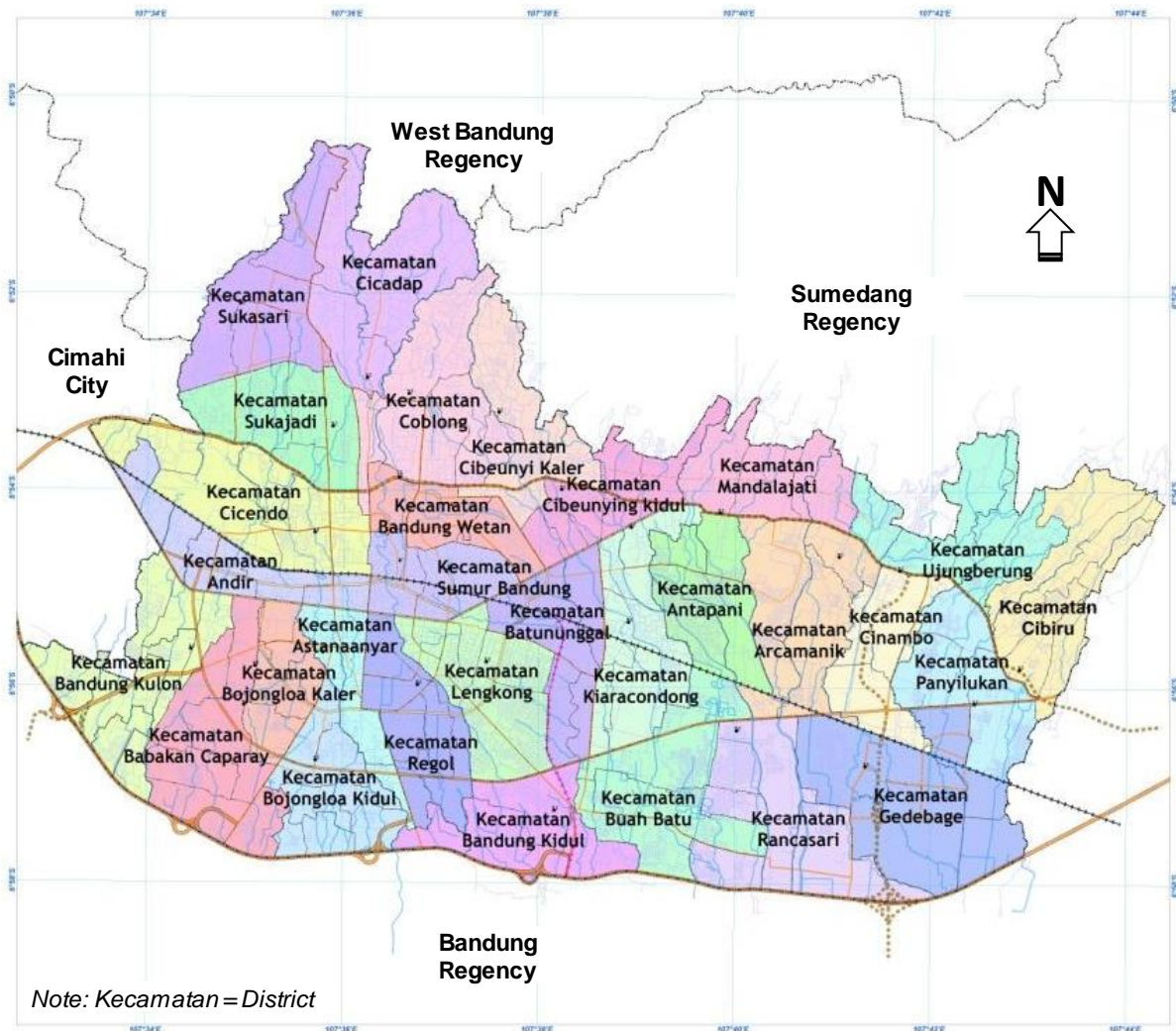


Figure 5.2 Divisions of Districts in Bandung City

Source: Bandung City Development Planning Board, 2018

Level of Service from Bandung City Water Company

Most of the need for domestic water is supplied by the local water company [*Perusahaan Daerah Air Minum/ PDAM*], named Tirta Wening. This company belongs to the government of Bandung City, which is mandated to provide drinking water and

manage the city's sanitation system. The company is merely an operator to supply water because policy and funding are the domain of the respective local government.

The current problem of domestic water supply for the City of Bandung is not only about quantity, but also quality and continuity. The current production and distribution capacity has not been able to fulfil all the needs of the residents of Bandung. The company's Geographical Information System (GIS) (See Figure 5.3) shows that the service of the water company covers most of the area, but some parts of the area in the east, north, and west parts near the city border are not covered. The uncovered area is farther from the main water treatment plant situated in the centre of the city.

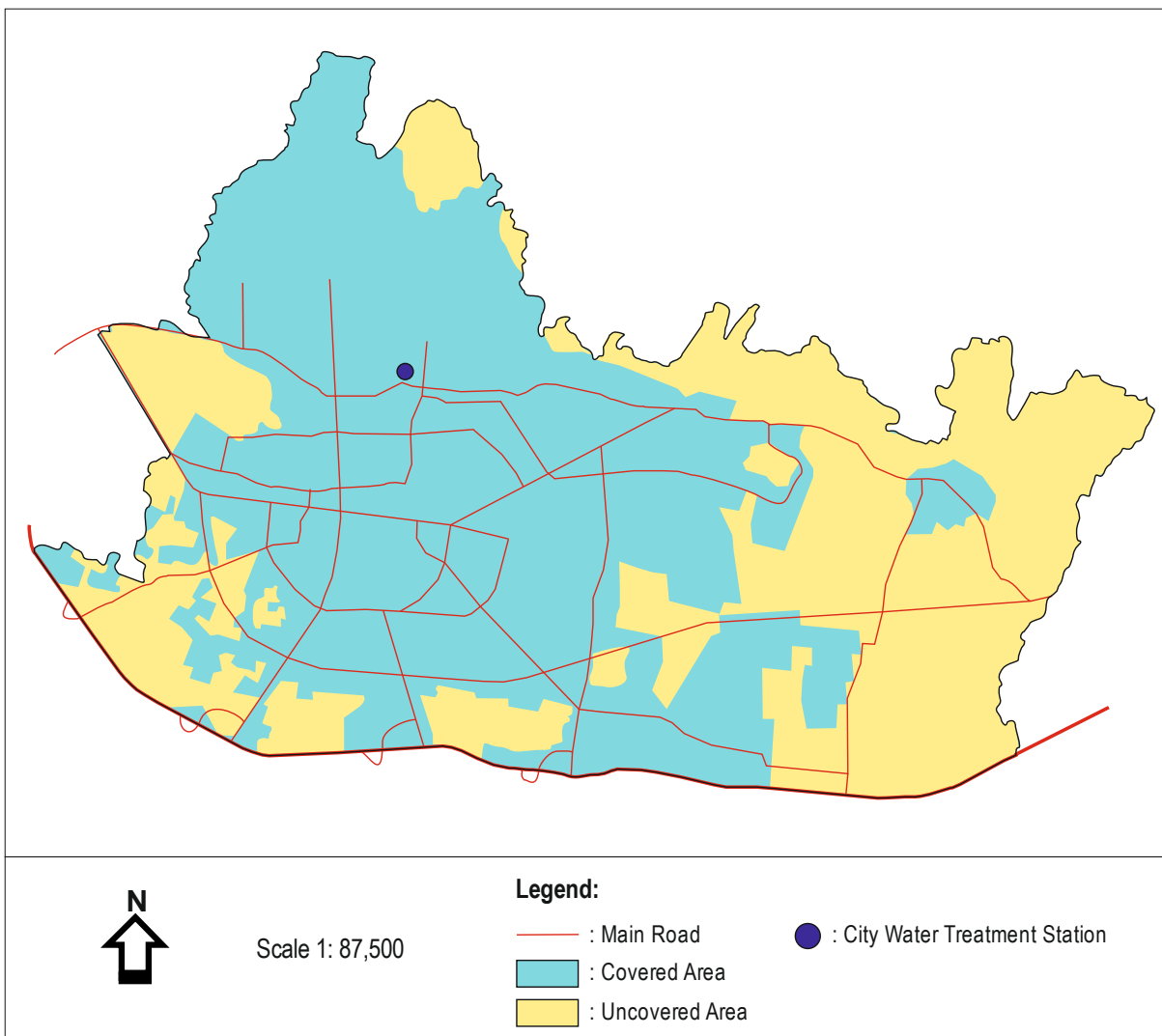


Figure 5.3 Service Coverage of Bandung City Water Company

Source: adapted from Bandung City Water Company (2018)

However, more than half of the households with pipeline connections are not served for 24 hours daily. Some of the households only have five hours of water running to their house every day. The farther from the city centre, right at the centre of

the city, the less water supply they receive because the main city water treatment station is located in the central part of the city.

A planning official in the water company said,²² “(at the area near the border) there is an existing pipeline network, but the water running to that area is minimal because it is too far to the city border. Up to now, they have used private wells in their households. So, it is minimal. Even though there is a pipeline network, the service is very minimal. Therefore, they hope for this programme (the regional water supply programme). Besides limited water quantity (from the company’s pipeline network), it is also not safe to consume.”

For the problem of untreated water, another official from the planning division of the water company added,²³ “The main problem of the company is with the raw or untreated water, because 90% of untreated water for Bandung City is supplied from out of the city.” The problem of untreated water is coupled with other problems such as the lack of investment in infrastructure due to the limited financial capacity from the local government for the water company (Antono, 2018).

5.3 Regional Water Supply System in Metropolitan Bandung

The discussion in this section is on the overall regional water supply system in Metropolitan Bandung, including the issues behind the need for the regional development, the regional system itself, and the expected benefits for Bandung City as the focus area of this research. This section gives an overall view of the regional system before providing more detail on the South System.

5.3.1 The Regional System

The first discussion to build the regional water supply was held in 2009. The head of Water Supply Division under West Java Provincial Government said, “It is based on the needs of cities and regencies (within Metropolitan Bandung) of Bandung City, Cimahi City, Bandung Regency, West Bandung Regency, and Sumedang Regency.” Following this discussion, a regional water supply system in Metropolitan Bandung was initiated.

²² In a face to face interview.

²³ In the group discussion held in Bandung.

Hydrology in Metropolitan Bandung

Bandung is a part of the Upper Citarum basin area. This is because the main river in Bandung Metropolitan is the River Citarum that flows from east to west and divides the Bandung Basin. Rivers have been used as raw water for the domestic water supply, including River Cisangkuy as one of the sources for the regional system. Other surface water used for domestic water supply is lakes [*situ*] and reservoirs.

Most of the rivers in Metropolitan Bandung fluctuated greatly in their water charge, with a significant low for six months of the dry season. Due to the lack of water resources, it is inevitable that regional cooperation in the water sector will be conducted. The head of the Water Supply Division²⁴ said, “After a series of meetings, it was agreed about the potential water sources, but we need to develop a system across cities/ regencies.”

River Cisangkuy (see Figure 5.1), in the area of Bandung Regency, has been the source of water for Bandung City for an extended period. The river still has sufficient water charge to supply the South System of the regional water supply in Metropolitan Bandung. Furthermore, the extension of the South System will take additional water from Santosa Reservoir in the south part of the River Cisangkuy.

Overview of the Regional Water Infrastructure System

Overall, five regional water infrastructure systems were planned to support the improvement of water supplies for the residents within Metropolitan Bandung (WJPG, 2010a). These five systems are the South System, West Systems 1 and 2, and East Systems 1 and 2. Four of the five regional systems provide additional water for Bandung City, except the regional system of West Bandung 2 which will serve West Bandung Regency and Cimahi City.

These five regional systems are pipeline-based supply with respective special management to operate the system. A planning official in the Directorate of Water Supply said, “This regional system is not like the old cooperation when only buying and selling raw water from one local government to another without any other institution involved.” The provincial or central government can appoint this special operator.

²⁴ Under the West Java Provincial Government.

The development of the whole system should be completed by 2030 (WJPG, 2010a). The first pilot programme was the South System, and its first construction phase should have been 2011 to 2015, but in fact it began in 2012 and completed in early 2019.

Development of the South System: The Case Focus

Since the West and East systems are future programmes, this research focuses on the South System, specifically the first phase, and looks at the implementation stage so that the whole organisational processes can be captured from planning to the completion of the programme.

The expected amount of additional water for domestic use is 1,400 litres/second in total for Bandung City and Bandung Regency, and is estimated to fulfil the needs of 280,000 beneficiaries. However, the total is not expected to be achieved until 2030 as the target is divided into four phases equally of 350 litres/second from each phase (WJPG, 2010a).

According to the reviewed master plan, the construction work for the South system is divided into four phases as follows (WJPG, 2016):

1. First Phase (initially planned from 2011 to 2015)

This phase began in 2012 and is expected to finish in 2019. The expected outcome is 350 litres/second of additional water for Bandung City (200 litres/second) and Bandung Regency (150 litres/second). The source of untreated water is from the River Cisangkuy. Figure 5.4 shows the scheme of the water supply infrastructure system from the water source leading to the branch distribution for Bandung City and Bandung Regency.

2. Second to Fourth Phases (planned from 2016–2020)

Each phase is expected to provide another 350 litres/second of water with the same source of untreated water from River Cisangkuy and back-up from Reservoir Santosa situated in the South part of Bandung Regency near Garut Regency.



Figure 5.4 Illustration of the South System of Regional Water Supply

5.3.2 Expected Benefit for Bandung City

An agreement has been reached for the first two phases, such that both the city and regency will receive the same amount of bulk water in total. There is a different share for each phase, where from the first phase Bandung City will receive 200 litres/second and 150 litres/second for Bandung Regency. It is the other way around for the allocation of the bulk water from the second phase, where Bandung City will receive 150 litres/second and Bandung Regency 200 litres/second (WJPG, 2010a).

A planning official from Bandung City Water Company said, on 22 March 2018, that, “We (Bandung City) will get 200 litres/second. With the assumption of 20% water loss, we will only serve around 18,000 household connections.” However, during the ceremonial inauguration of the system on 10 January 2018, the West Java Governor said that the system would serve 16,000 household connections or 80,000 people (Hutapea, 2018). This discrepancy should not be an issue since both calculations are based on assumptions.

Spatially, according to the Presidential Regulation concerning the Spatial Plan of Bandung Basin Urban Area issued in 2018, the South System will serve the south east part of Bandung City, namely District Kiarascondong, District Bandung Kidul, District Bojongloa Kidul, District Gedebage, and District Rancasari. Since these locations are mentioned in the Presidential Regulation, it should be binding (GoI, 2018).

5.4 Programme Preparation

This section discusses the first part of the organisational processes of the South System, which is the planning and preparation of the programme. This section covers the first initiation of the programme, the needs assessment, related policy, supporting spatial and development plans, sectoral and technical planning, and the feasibility study, which included related environment study, as well as the programming stage through to budgeting.

5.4.1 Initiation

The initiation for the regional water infrastructure system was in 2009 from a discussion on how to achieve Millennium Development Goals (MDGs). The head of the Water Supply Division under West Java Provincial Government said, “The terminology we used was towards achieving MDGs....the discussion not only covered water supply, but also other sectors related to MDGs, such as drainage, waste disposal, and sanitation.”

Regional cooperation in the water supply sector began after the implementation of regional cooperation in the waste disposal sector started in 2004. Similar to the regional cooperation on waste disposal, that in the water sector also includes multi-stakeholders, multi-financial resources, multi-year development, and the like. Since the need for investment is increasing, and one of the means for more efficient spending is through regional cooperation, it was decided to invite all the stakeholders to build regional cooperation.

As a follow up from this first initiation and series of further discussions, the Memorandum of Understanding (MoU) was signed in 2010 to implement regional cooperation in human settlement sectors. For water supply development, it was agreed to develop the South System, as the pilot project, and also the long-term programme of the West and East Systems.

This memorandum also sets out the detail of the discussion on the total capacity of the additional supplied water and distribution to each region. It was also agreed that the central and provincial governments would conduct the construction of the production unit, and the main distribution networks will be carried out by the provincial government. Moreover, the branch and household connections are the responsibility of the local water company.

5.4.2 Needs Assessment

Although Bandung City is one of the largest and most developed cities in Indonesia, the lack of safe potable service from the water company is real. However, the pressure to improve the service does not seem high because there are many alternatives to obtain clean water from non-pipe based water suppliers in the city. Packaged water is the most popular, such as bottled water, jerry canned water, and water in gallons, or water distributed using water tanks.

Regarding conducting a needs assessment of the domestic water supply for Bandung City, two organisations conduct this, namely the local water company and the City Health Agency or Human Settlements Agency; however, there is an issue as the division of coverage is unclear. This issue may mean that needs are inaccurately identified and lead to an inaccurate strategy and plan to address water problems.

A planning official from Bandung City Water Company said, “There is confusion when calculating the level of service in the city. Our colleagues from provincial governance sometimes get confused about why Bandung City has reached a high level of service for their domestic water supply. It happened when they asked for the data from the water company because we only have data on company performance. For the overall level of service in the city, I would say that the data should come from the city’s Health Agency or Human Settlements Agency. This confusion should be issued from one door. That is not our responsibility.”

Nevertheless, it is agreed that the lack of raw or untreated water is the biggest issue in Bandung City. The head of the Raw Water Division under the Ministry of Public Works and Housing said, “The quantity of raw water from the current sources compared to the needs of the population for Bandung City is below par. We have identified the other sources of raw water that can be channelled to fulfil the needs of Bandung City but these are from outside the city.”

The need for regional cooperation was discovered during several meetings in 2009 with numerous stakeholders such as central, provincial, and local governments, and also local water companies. The head of the Water Supply Division in West Java provincial government said, “The representatives from Bandung City, Cimahi City, Bandung Regency, West Bandung Regency, and Sumedang Regency did a presentation about their respective needs. Besides these needs, we also discussed the challenges, and the main one is the lack of raw water and investment.”

Furthermore, a more comprehensive needs assessment was conducted during the formulation of a master plan for the regional system in 2010 (WJPG, 2010a). It was then reviewed in 2016 after several construction projects for the South System have been accomplished (WJPG, 2016). However, these master plans remain drafts and have not been enacted as a statutory.

There may be a high expectation from the regional water supply system to provide additional water supply. However, the Head of Planning for Water Supply²⁵ said, “It should be understood that, although the regional water supply system cannot solve all the problems of water supply provision, it is important to address some issues. Firstly, we can address the need for raw water. Secondly, there must be an increase in service provision, although it varies between one region and another.”

5.4.3 Policy

The idea of a regional approach was formulated in the formal Government Annual Development Plan of 2012. This followed the first initiation to apply the regional approach for water supply development in Indonesia discussed in 2009. Metropolitan Bandung was one of the first regions applying the new cooperation model.

The government sees that policy for implementing regional cooperation in the water sector is the right choice addressing the current issues on the domestic water sector. The Head of Planning for water supply, under the Ministry of Public Works, said, “Regional cooperation on water supply in Bandung is non-negotiable. There are several reasons behind the need for a regional approach, such as the technical considerations on the lack of raw water, and the need for investment efficiency.”

A policy to implement regional cooperation was introduced in 2006 through a Public Works Ministry Regulation concerning National Policy and Strategy in Developing the Water Supply System (MoPWH, 2006). The regulation only touched the possibility of support from the central government for physical development in the region and was not elaborated further in detail until the regulation was revised in 2013.

The new regulation of 2013 identified issues and challenges in implementing regional cooperation, namely from organisational capacity and issues of raw or untreated water (MoPWH, 2013). From organisational capacity, the central government should emphasise developing provincial and local government capacity to

²⁵ Under the Ministry of Public Works and Housing.

implement regional cooperation, by providing advice on formulating the regional master plan, a feasibility study, business plan, and also during the implementation stage. The central government assists organisational setup and provides funding for physical development.

The national policy and strategy should be divided into provincial and local policy and strategy. However, according to one of the staff from the water supply division in the West Java provincial government, the province did not formulate such a policy until 2017. It was signed by the Governor to be applied as guidance for water supply development from 2017–2022.

Accordingly, the planning processes and implementation of the water supply development programme in West Java province before 2017 had no formal policy guideline, in contrast to Blakemore and Griggs (2007) assertion that policy is needed to define aims or goals, and to state what ought to happen. Indeed, a Sub-Director in the Water Supply Directorate²⁶ said, “In the future, we do not want to be busy only executing physical development projects; we need to formulate policies to improve our organisational performance. We need to improve the quality of working mechanisms so that the projects can be smoothly executed. Moreover, regional water supply is one of the hardest projects to execute, at least due to its size and intergovernmental issues.”

5.4.4 Spatial Planning

One essential document on physical development which requires a significant amount of land concerns spatial plans. The following discussion in this section focuses on the content of spatial plans to see whether these documents might support the development of regional water infrastructure system in Metropolitan Bandung. It discusses the provincial, metropolitan regional, city, and detailed spatial plan documents.

Spatial Plan of West Java Province 2009–2029

The current Spatial Plan Document of West Java Province is for 2009–2029, and was legalised as a provincial regulation in November 2010 (WJPG, 2010b). There are two aspects in the provincial spatial plan on the development of regional water

²⁶ Under Ministry of Public Works and Housing

infrastructure system. Firstly concerning the development focus and direction for the Bandung Basin region and secondly the content of the plan document concerning the water sector.

Considering the economic activities in the region, Bandung Basin in the context of the National, Provincial, and Metropolitan Spatial Plan was chosen to be a national strategic area [*Wilayah Pengembangan Strategis/WPS*]. It will be the centre of the development, with the main activities on trade and services, creative industries, and high technology development, but also tourism. Given Bandung Basin's status as a national strategic area, it is justifiable that the central government should invest more in this area, including in the water supply sector, even though this is the domain of the local government.

Unfortunately, the guidance on the regional water infrastructure system in the provincial spatial plan is very minimal, and only covers the plan on the development of Santosa water reservoir in Bandung Regency, as the source of untreated water for the South System in the third and fourth phases. It does not even mention that Santosa Reservoir will be utilised as the water source for Bandung City and its surroundings.

Considering that the first discussion for developing the regional water system in Metropolitan Bandung was initiated in 2009, in the same year as the formulation of West Java Spatial Plan, it is reasonable that the regional system is not included in the plan document. Moreover, the formulation of this provincial spatial plan document in 2009 was following the previous guideline that did not mandate the inclusion of the regional water system in the provincial spatial plan.

Fortunately, there is a new guideline concerning the formulation of a provincial spatial plan, issued in January 2018, which gives a mandate to implicitly include in the plan any regional water supply infrastructure that comprises more than one local government within the province. This mandate will be a reliable back-up for the development of the regional water infrastructure system in Metropolitan Bandung.

Spatial Plan of Metropolitan Bandung Basin

Below the level of the provincial spatial plan, in terms of spatial coverage, the spatial plan for Bandung Basin Area was issued in June 2018 under a Presidential Regulation (GoI, 2018). This plan should be used as a tool for operationalising the national spatial plan and as the basis for conducting coordination in developing the metropolitan region.

The scope of this Presidential Regulation arrangement includes (Gol, 2018):

- a. The role and function of the plan and the coverage of the planned Area;
- b. Goals, policies and spatial planning strategies of the Bandung Basin Urban Area;
- c. Plans of the spatial structure and spatial pattern, the direction of spatial utilisation, and the direction for controlling the spatial utilisation;
- d. Management of the Bandung Basin Urban Area;
- e. The role of the community in spatial planning in the Bandung Basin Urban Area.

This spatial plan delineates the area of Metropolitan Bandung, which includes the core urban area [*kawasan perkotaan inti*] and its surrounding area. The core urban area includes Bandung City and Cimahi City, while the surrounding areas include urban areas adjacent to the core urban areas which comprise Bandung Regency, West Bandung Regency, and the east part of Sumedang Regency (see Figure 5.1).

The Regulation details the coverage of the service areas of the regional system both for South and West-East systems to particular districts. This spatial plan also regulates zoning based on three criteria of activities, namely (Gol, 2018):

- a. Permitted activities, including water supply development activities and water supply supporting infrastructure development activities;
- b. Other activities which are restricted but can be permitted, as long as do not interfere with the function of the water supply system;
- c. Non-permitted activities, i.e. the activities that interfere with the sustainability of the water supply function, resulting in contamination of untreated water from wastewater and waste, and damage to drinking water infrastructure and facilities.

Although this plan did not regulate the first phase of the South System from the beginning, it will indeed guide the further development for the extension of the South, and new development of West and East systems. This plan will also be a strong basis for justifying budget allocation and other commitments from all stakeholders.

Bandung City Spatial Plan 2011–2031 and Detailed Spatial Plan 2015–2035

The current Spatial Plan of Bandung City covers development in the city from 2011 to 2031 (BCG, 2011). The spatial plan is detailed in the Detailed Spatial Plan 2015–2035 for particular parts of the city (BCG, 2015). The elaboration of the water sector in both spatial plans is more on the development of internal infrastructure system and its water resources. It is not explicitly stated which programme, projects, or activities are supporting the development of the regional water infrastructure system of Metropolitan Bandung.

The only part related to the development of the water sector in Metropolitan Bandung is the plan to help protect the untreated water source at Santosa water reservoir and the River Cisangkuy. However, it is not detailed in the programmes and projects. The plan also mentions improving water services in the east part of the city, which is also not precise enough where the additional water will come.

An example is the development of the water supply network in Gedebage, as one of the coverage areas of the regional water infrastructure system. The Detailed Spatial Plan covers developing the untreated water network from River Cisangkuy coupled with transmission pipe until the secondary distribution pipeline. In this statement, it is unclear whether this supports the implementation of the regional system, or something else.

5.4.5 Development Planning

Development planning discussed here is the medium-term development plan at national, provincial, and Bandung City level, including the review over national annual development work plans. The discussion shows how the plan documents support the regional water supply programme.

National Medium-Term Development Plan 2010–2014 and 2015–2019

According to the National Medium-Term Development Plan 2010–2014, the development of the water sector was focused on achieving MDGs target (GoI, 2010). The target was to fulfil the needs of half of the population who do not have access to safe potable water and sanitation and halve the poor population who inhabit informal settlements. The Indonesian government translated the target for the water sector to increase household access to adequate drinking water by 68.87% in 2015.

The effort to increase the amount of untreated water has been a regular programme every year. However, the nomenclature of regional water supply was not been introduced in the National Medium-Term Development Plan 2010–2014. Regional cooperation on water supply in 2010–2011 was seen merely as selling and buying untreated water between regions, with no particular operator managing and operating the infrastructure system.

The plan also sought to provide domestic water supply for 70% of the population by the end of 2014, 32% of which was from piped-based supply and 38% from non-piped. However, in the breakdown of the plan, no target was given concerning the

regional water infrastructure system. Similarly, the target for raw or untreated water in 2010–2014 was to achieve an additional 43.4 cubic metre/second and maintain the service of untreated water at 44.8 cubic metre/second, but there was no mention of the regional system.

The targeted additional domestic water supply from the regional water infrastructure system is stated in the next planning term for 2015–2019, and targets an additional 1,320,000 household channels from the regional system by 2019 (GoI, 2015c). However, there was no detailed target for raw water from the regional water supply infrastructure development in the medium-term plan.

National Annual Work Plans 2010–2011 and 2012–2018

The grouping of the annual work plans of the central government from 2010–2011 and 2013–2018, which is different from the period of the medium-term development plan, is based on the nomenclature of the regional water supply system. The change to this nomenclature can be seen from the water supply sector under human settlements infrastructure, while the terms for the output of untreated water projects remain the same from 2009–2018.

As discussed earlier, before 2012, the regional water supply was not recognised in the development plan of the central government, nor the medium-term or annual plans. The output from water supply projects before 2012 was within the scope of a city or regency, and even for the smaller area in urban and rural villages and communities, most continued with the current annual plan.

The target for regional water supply was first stated in the 2012 Annual Development Plan in three regions, including the South System in Metropolitan Bandung. The target for three regions remained the same for 2013, but then became five regions in 2014, and six in 2015.

The output unit for regional water supply in the annual development plan has changed from “regions” to “household connections”, starting in 2016. This change follows the change of the regime of the medium-term development plan. It was targeted to achieve 189,493 household connections from the regional system in 2016, 35,000 in 2017, and 35,000 household connections in 2018. The specific nomenclature for a priority programme is essential, in order to support it and to be a strong justification for the budget allocation and implementation of the programme.

West Java Provincial Development Plans 2013–2018

Some major issues concerning water supply provision are discussed in the development plan, such as the lack of untreated water resources for domestic use and irrigation, and the decline of carrying capacity of many rivers across and within the province. Additionally, low provision and distribution of safe potable water have also been identified as a problem in a wider area of the province.

The percentage of water supply service was 52% at the beginning of the planning period, showing that more effort should be put into action. It was targeted to achieve 74–76% of the service at the end of the term by 2018. Considering the main problem on the availability of untreated water, the focus of the development on the water sector in Metropolitan Bandung is to improve the quantity of untreated water by developing water infrastructure and its quality by preventing water pollution.

The policy to conserve water resources has been the goal in improving the condition and function of rivers, water reservoirs, and other water resources that can meet the needs of untreated water and irrigation for household, urban and industrial uses, and the like. It was planned to conserve the existing reservoirs in West Java, by normalisation and maintenance of rivers, and improvement of the protection and management of lakes and springs.

Unlike in the previous West Java Medium-Term Development Plan for 2008–2012, a plan to improve the water service for the metropolitan region through regional cooperation was formulated. This is part of the policy to provide drinking water infrastructure, which also includes the improvement of infrastructure for low-income persons, and another centre of national activities [*pusat kegiatan nasional*].

Although there was an addendum to the West Java Medium-Term Development Plan in August 2017, near the end of the current administration of the governor, there was no change to the policy, strategy, and target for water supply. By not revising the target in the range of 74–76%, this did not support the achievement of universal access to safe potable water by 2019 that was set by central government.

Bandung City Medium-Term Development Plan 2013–2018

Service coverage for safe potable water of 85% was targeted for 2018, up from 68% in 2013. The target is far from the national target for universal access by 2019. The untreated water production capacity again strongly determines it. Therefore, one of the strategies is to maintain and improve untreated water sources for domestic purposes (BCG, 2014).

Programmes or projects to support the development of a regional water supply system, in the form of service units and further pipeline network for household connections, are not mentioned in the medium-term plan. Although the water company can do it, this should be included in the plan since a change in the water supply sector will have an impact on the city as a whole. Moreover, most of the investment spent by the water company is from the city government's budget.

5.4.6 Draft Master Plan for the Water Supply System

According to the master plan, the Master Plan is regulating pipeline-based and non-pipeline drinking water system (WJPG, 2010a). It contains the projection of the need for water supply in a particular period, divided into several stages and the main components of the system and its dimensions.

The issue for the master plan is that it remains a draft and is never statutory. One member of the planning staff from the Water Supply Directorate in the Ministry of Public Works and Housing said, "The first requirement to get funding from the state budget is the master plan for the water supply development. It should not only be the document but should have been statutory....at the moment, we remain 'soft' (not strict to the requirement), but at least the master plan document is available".

Draft Metropolitan Bandung Master Plan of Water Supply System

The Metropolitan Bandung Master Plan of Water Supply System [*Rencana Induk Sistem Penyediaan Air Minimum / RISPAM*] was first formulated in 2010 (WJPG, 2010a) and reviewed in 2016 (WJPG, 2016). It was particularly formulated for the development of a regional water supply system in Metropolitan Bandung, in the South, West, and East systems.

According to the Master Plan for Metropolitan Bandung Urban Area in 2010, the regional development system was prepared for 20 years from 2010–2030 (WJPG, 2010a). The planning and implementation period is divided into four phases, and each phase into several sub-phases considering the existing conditions.

Overall, for the whole water supply development programme, programme phasing is stated in the master plan as follows (WJPG, 2010a):

- Phase I, the urgent phase (planned 2011–2015), had a service target of 77% from the existing condition of 40%;

- Phase II, III and IV, a long-term programme. The service targets are projected at 95% of the coverage area of the Metropolitan Regional Bandung.

As described earlier, the research focus is on the South System of the regional water infrastructure. This research focuses more on Phase I to determine which lessons can be learnt to improve programme preparation and implementation.

Nonetheless, this master plan has not been legalised, and remains flexible when there is a need for an adjustment. This flexibility can be for positive and negative reasons, for example, the need to change the service area as demanded by water companies in Bandung City. On the positive side, when it is set up to be more flexible, the programme will address the most current problems or demands. However, flexibility may mean more tolerance of delay in completing projects as expected.

Draft Bandung City Master Plan of the Water Supply System

The draft master plan for Bandung City was formulated in 2009 by the city water company, PDAM Tirta Wening, for the next 15–20 years (Bandung City Water Company, 2009). It remained a draft since the document was not signed by the Mayor of Bandung City to become formal guidance for investment and operation of the city government and the local water company.

This master plan divides water supply development in Bandung City from 2009 into two priorities: improving internal production and distribution capacity, conducted by the local water company, and expecting additional water from the regional system in Metropolitan Bandung. Although it was prepared in 2009, this Bandung City master plan includes plans for the regional water infrastructure system, but with limited information in detail as the regional system was under initial discussion. The uncertainty of the regional system development in 2009 meant the plan document was focused on elaborating the local potential more.

5.4.7 Feasibility Study

According to the current Public Works and Housing Ministerial Regulation concerning the Development of the Water Supply System, a feasibility study is defined as a study to determine the feasibility level of a proposal for the construction of a drinking water supply system in terms of technical, environmental, social, cultural, economic, institutional, and financial aspects. Since the expected future benefit would be more than 10,000 people, a complete feasibility study should be conducted. It is a study of

the feasibility of developing a part or all of the system determined by financial, economic, technical and environmental developments in the study area. Feasibility studies must also assess risks which are not present in the draft master plan for the programme in Metropolitan Bandung.

For the South System of Metropolitan Bandung, there was no particular project for conducting the feasibility study. The calculation can be seen from the draft master plan of regional water supply for Metropolitan Bandung. It was surprising because the feasibility study was conducted after construction. An official from the Water Supply Division under West Java Provincial Government clearly said that this was an irregular step in executing the programme: “It is flipped, construction work was done first and then the feasibility study was formulated.”

After the first analysis of feasibility, the appointed operator of the regional water supply conducted a review of the previous feasibility study. This was done after the untreated water and production unit had been completed, and the construction of the distribution pipeline network was on-going. An official from West Java Water Supply Division said, “We made the feasibility study included in the master plan, and then TGR [Tirta Gemah Ripah] as the operator [of the regional system] also made the review of the previous feasibility study”.

From a financial aspect, the development of a regional water supply system in the feasibility study was calculated as a feasible programme. The calculation used financial projections to predict the financial performance of an institution as receiving funds over the next few years by taking into account other related aspects, such as technical aspects or management aspects.

An environmental impact analysis was also prepared when some construction works were on-going. This should be done in any complete analysis to assess the feasibility of developing a part or all of the water supply system, and indeed it identified potential, unanticipated risks in the first instance. For example, the potential risk of pipeline installations that disrupted local traffic was not anticipated, and led to a delay in completing the infrastructure system.

5.4.8 Programming

The head of the Water Supply Division in West Java provincial government said, “The first discussion for the regional system was followed up by an agreement between or Memorandum of Understanding (MoU). This was followed by a cooperation agreement

that divided who does what and by which budget sources a project would be financed.” The discussion in this section reveals how the detail of the water supply programme was arranged, and later the next section focuses on its implementation.

Programme Formulation and Arrangement

DonVito (1969) says that the purpose of programming is to convert plans into a specific action schedule for an organisation by developing detailed resource requirements and the actions needed to implement plans. The conversion of plans for the development of the South System was done by segregating the responsibilities of every project executor as agreed in a Memorandum of Understanding (MoU) and Cooperation Agreement. The division of the tasks is quite clearly demarcated, including for the construction work. In this regard, all of the projects had the same objective of providing additional water supply for Bandung City and Regency.

However, there were no individual or organisation controls of the implementation of the agreed points within the MoU and Cooperation Agreement. For example, while it was agreed that coordination is the domain of provincial and central government, the role of the coordinator under the framework of a programme was missing. Without any further operational guidelines, no individual managed the whole project and its activities in a coordinated way. One of the heads of sub-division in the Water Supply Directorate²⁷ said, “We reviewed some MoUs and Cooperation Agreements to come with a conclusion that we need to improve the quality to make it more binding.”

All the interviewees agreed that a programme manager or programme management office is needed for a programme that involves multi-stakeholders and multi-financial sources, and should be completed in more than one year. Moreover, the absence of an agreed timeline has also led to a delay in completing almost all parts of the infrastructure system. A planning official from Bandung City Water Company said, “If we want to implement full regional cooperation, there must be a referee. That is one of the responsibilities of the Programme Management Unit. Otherwise, there will be a long debate again like when we were deciding the distribution capacity to Bandung City and Bandung Regency. It was solved by ordinary meeting refereed by the provincial government, not a special management unit.”

²⁷ Under the Ministry of Public Works and Housing.

He also added that, “There was a thought about the management unit, but since people tend to like to work and work for the construction and because the fund is already available, then there was nobody synchronising city, regency, and provincial government... So, firstly there must be a programme management unit otherwise we will have hassles again. PMU can be the leader. Secondly, there must be a clear timeline, to avoid idle time. The key is with the programme management unit!”

Looking at the discussion above, Gray (1997) would classify this type of programme as a “loose programme”, which has no managing role synergising all the activities and actors. The flow of information between actors is merely a report. It also occurred in all stages during the development of the South System, where the coordination was good because of the personal relationships among the leading actors in each institution involved. An official from the Bandung City Water Company said, “What we think has made the programme run quite well is that we have good relations as friends. Ideally, moreover, for the construction stage, there must be an integrated team in the form of PMO [Programme Management Office] or PMU [Programme Management Unit]. So, there is one [individual or organisation] in command.”

The personal connection between the leading actors is linked to the fact that most of them graduated from the same institute as undergraduates. From observations during fieldwork, these close relations were also well built because they speak the same local language of Sundanese, and they often used it during informal meetings or other activities.

One of the effects of the absence of a programme manager is the absence of the programme plan and design. The programme plan is a crucial control document which forms a complete picture of how the programme is going to work (Sowden, 2011). The draft master plan for regional water supply development in Metropolitan Bandung was formulated in 2010 and reviewed in 2016, which was insufficient for this role because it has no detailed timeline for particular projects.

Memorandum of Understanding

For the regional water supply in Metropolitan Bandung, the MoU was the first formal agreement after the initiative to conduct regional cooperation discussed in 2009. The memorandum covers multiple sectors, not only water supply but also waste disposal and sanitation. Then, to operationalise the implementation of each programme, this MoU is then followed up by a separate cooperation agreement for each sector and other further planning and implementation of activities and projects.

This memorandum concerns regional cooperation for the development of water supply infrastructure, waste disposal, and sanitation in Metropolitan Bandung and the surrounding area, and was signed in June 2010. It was agreed by representatives from Bandung City and Bandung Regency, and signed by the head of the local government of the surrounding area, namely Sumedang Regency, Garut Regency, West Bandung Regency, and Cimahi City.

Regional cooperation on water supply was the new scheme, at that time, towards the achievement of Millennium Development Goals in 2015. This memorandum in 2010 was actually a follow up of the previous memorandum between provincial and local governments signed in 2004. For the 2010 MoU, the parties involved were extended by inviting central government and involving other sectors to become involved.

All signatories agreed to formulate plans and other preparation according to their position and authority. They also agreed to appoint central and provincial governments as the coordinator for every process. The development of the regional infrastructure system includes the development of the untreated water unit, a distribution unit, service unit, and a management unit.

It was agreed to develop the South System, as the first phase, and also the future programmes of the West and East Systems. This memorandum made detailed calculations about the total capacity of the additional supplied water and the distribution to each region. It was also agreed that the central and provincial government would construct the production unit and main distribution networks, including financing them. However, the memorandum can be extended and amended when there is a change in circumstances, related policies, and laws and regulations. It is emphasised that the change of administration or the heads of government will not affect the agreement. The detailed responsibilities of each signatory are as follows:

1. Central Government

The central government has responsibility to construct raw/untreated water units, provide technical assistance to provincial government to improve their organisational capacity and personnel in managing the operations of water infrastructure, and provide a technical assistant for the appointed operator for the new regional system;

2. West Java Province

The province constructs the production unit and its main distribution network, including the land provision and detailed design; appoints a management unit as the operator; and, provides a technical assistant to improve community involvement to protect untreated water and its surrounding area;

3. Local Governments

These construct further service units and household channels, improve organisational capacity in managing water provision in the respective administration, and advise people in the respective area to have a pipe-based water supply. They also reduce water leaks and protect untreated water sources.

Cooperation Agreements

Two cooperation agreements in 2013 and 2016 were signed by the central, provincial, and local governments as the follow-up to the MoU signed in 2010. The following gives an overview on the content of each agreement.

The First Agreement in 2013

The first Cooperation Agreement signed in February 2013 concerned the Development of Regional Water Supply System in South Part of Metropolitan Bandung. This agreement follows up the MoU signed in June 2010 regarding the Regional Cooperation in Developing Water Supply Infrastructure, Waste Disposal, and Sanitation in Metropolitan Bandung. The agreement segregates the responsibilities of each representative for the construction work, operating institution, and utilisation of the system, towards achieving synergy of all the resources and acceleration of the development. The responsibilities of each party are detailed as follows.

1. Ministry of Public Works

The central government is responsible for assisting the overall development, providing technical assistance to institutions managing the infrastructure system, and constructing a production unit, and has the right to monitor and evaluate.

2. West Java Province

The provincial government is responsible for formulating a master plan for the regional water supply system, feasibility study, and detailed engineering design; it provides the required land, constructs the main distribution network until the

connections with the service units, appoints an operator, and has the right to conduct monitoring and evaluation.

3. Bandung City and Bandung Regency Government

The local government has responsibility for assisting and supporting the whole development of a water infrastructure system and appointing local government enterprise to manage services.

Besides respective responsibilities and rights, there are mutual responsibilities agreed in the memorandum, namely:

- Conduct coordination, assistance, and socialisation for the development of the water system with the respective authorities;
- Conserve the upstream area of the River Cisangkuy, towards sustainable water supply services.

In the case of a dispute, all parties should meet and achieve a new agreement. However, when the dispute cannot be resolved, the Home Office may be asked to solve the problem. This agreement is binding on the institution and unrelated to a change of administration or the head of an institution.

The Following Agreement in 2016

This second agreement in 2016 is between the provincial and local governments without representation from the central government. This agreement was meant to resolve the operationalisation of the untreated water, production unit, and distribution and service units.

To operate and distribute the bulk water, West Java provincial government appointed their government enterprise PT. Tirta Gemah Ripah. While the local governments also appointed their own water company [*Perusahaan Daerah Air Minum/ PDAM*] to manage water services under the regional system, the Regency government appointed PDAM Tirta Raharja, and the City government appointed PDAM Tirta Wening.

The establishment of this second agreement was focused on arranging the share of bulk water from the production unit, the bulk water tariff, and the status of the built asset. As described earlier, the total capacity of the first regional water infrastructure system is 700 litres/second, and divides equally into two phases. However, the allocation of water distributed to Bandung Regency and Bandung City is different in each phase.

The details of the programme arrangement that can be seen from the MoU and cooperation agreement should help in running the programme smoothly. However, the regional water supply programme faced delay as an indication that there were problems during the implementation or there are incomplete processes in the preparation stage. These issues will be elaborated in the following section discussing the implementation phase.

5.4.9 Budgeting

Budgeting concerns securing sufficient funds to put a programme into operation (DonVito, 1969). One well-known phrase describing the budgeting process within the framework of a programme, among government officers in Indonesia, is “money follows the programme”. This means that budget allocation is merely the consequence of planned or agreed programmes.

There were few issues concerning the budgeting process and allocation. One plausible reason for this is because, although strong plan documents did not support it, the programme has been a top priority for central, provincial, and governments and is compatible with political priorities as well. For the central government, besides considering the needs of additional water for Bandung City, the reason for prioritising the programme is that it was a pilot project that must be supported until completion to inspire replication in other regions. Otherwise, it would not be an excellent example for the further development of other programmes with the same scheme. For the provincial and local governments, the programme is an excellent opportunity to improve the service coverage of the water service.

The continuation of budget allocation could be an issue for a project running in more than one fiscal year when the project contract is not under a multi-year scheme. However, this was not so in this programme, and the consequence of not choosing the multi-year contract was that the project manager has to perform the procurement process every year; this can sometimes take around two months for one procurement.

There were also issues with the construction of raw water and main distribution projects that were not set up as multi-year projects. As a consequence, the project manager had to perform multiple procurement processes which needed 3–4 months for each process and led to more delay. The cause was the lengthy budgeting processes, especially with the provincial parliament. An official from the Provincial Planning Board said, “It is possible to set the [main distribution] projects as a multi-

year project. However, it will take months and maybe a year to process it because there will be a discussion with provincial parliament. Before that, the proposer should prepare a study document as the basis to make the decision.” This lengthy process has made the proposing institutions resistant to the process of the multi-year project.

5.5 Programme Implementation

Most of the discussion in this section is on the construction work on the development of a regional water system in Metropolitan Bandung for the South System, with the supporting projects such as preparing the engineering design and monitoring and evaluation. This section shows organisational processes, while implementing the programme in the South System of the regional water supply. These discussions are coupled with the discussion on the appointment of the operating management and the monitoring, control, and evaluation of the development programme.

5.5.1 The Infrastructure System

Cullinane (in Mays, 2002: 1.9) provides a scheme of functional components for a modern day water utility (Figure 5.5). It consists of an untreated water source, untreated water pumping and storage, a water treatment facility, and a water distribution network until the service connection. The typical facilities and tools for each element are also shown at the bottom of the scheme.

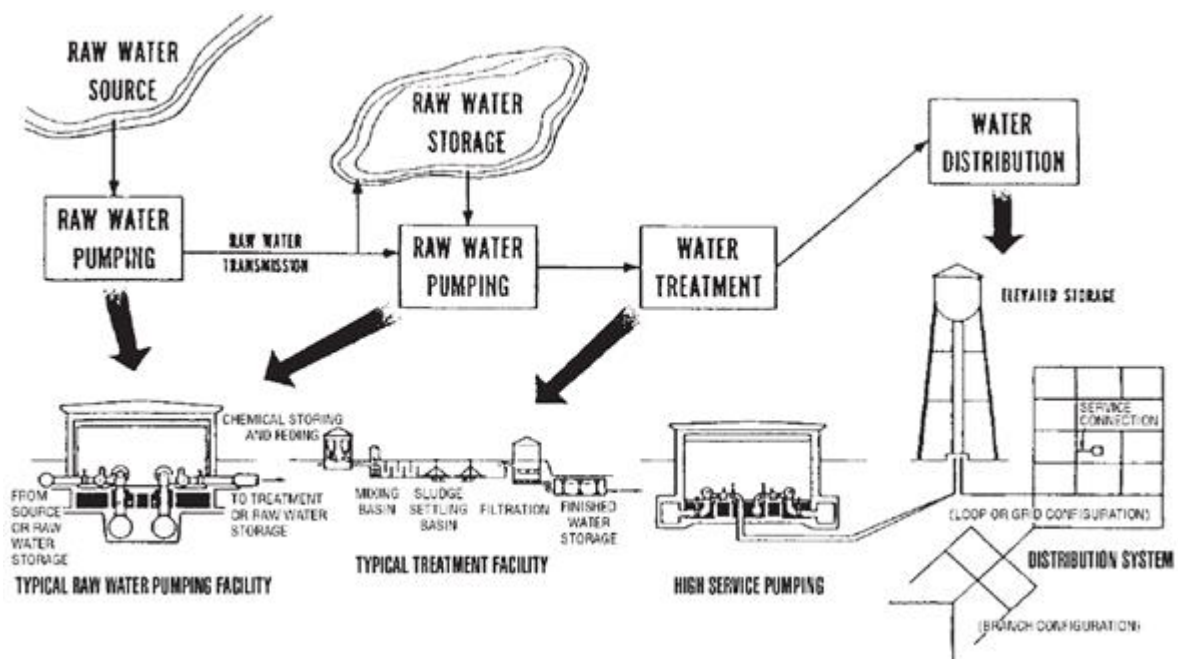


Figure 5.5 Functional Components of a Modern Day Water Utility

Source: Cullinane in Mays (2002: 1.9)

As discussed earlier in Chapter 1, the Ministry of Public Works and Housing divides the water infrastructure system into three, namely raw/untreated water units, water production units including main distribution, and branch distribution and service units. This thesis uses terms which are commonly used in the ministry.

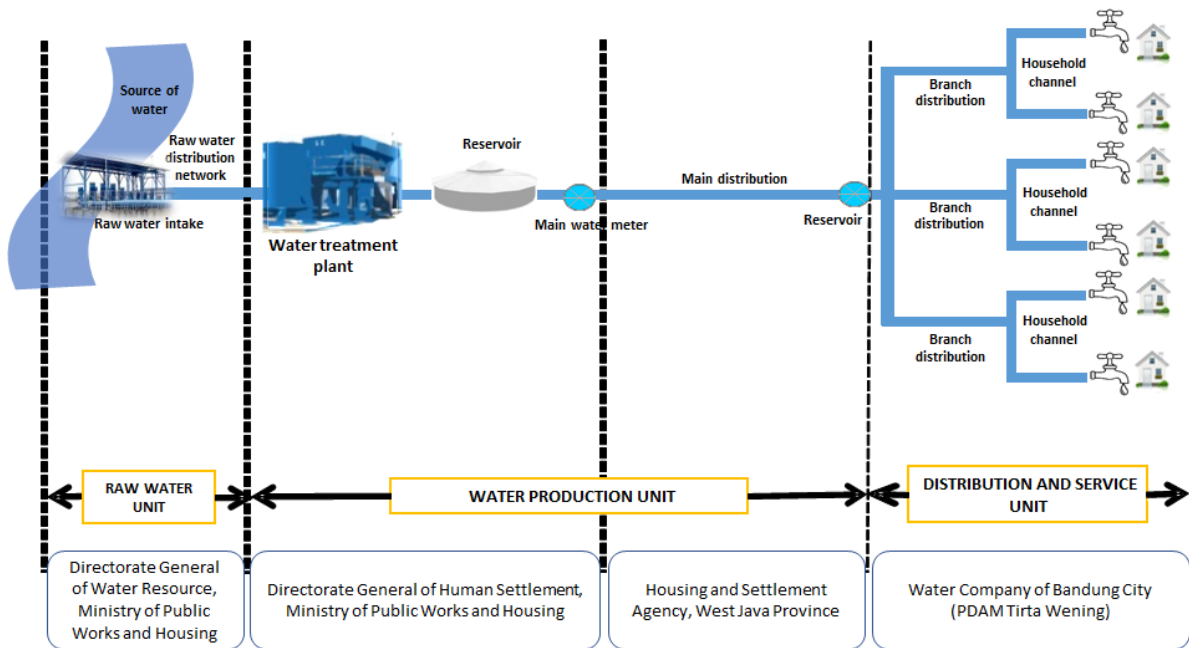


Figure 5.6 Projects Implemented in the Regional Water Supply System

Source: adapted from the Directorate of Water Supply Development/DWSP (2016: 13)

As can be seen from Figure 5.6, the lower part of the scheme of infrastructure shows the institutions responsible for the execution of the project, particularly for the construction work. The two institutions in the Ministry of Public Works and Housing with responsibility are the Directorate General of Water Resources, which dealt with untreated water units, and the Directorate General of Human Settlement, which constructed the water treatment plant. From the provincial governments, the Housing and Settlement Agency had responsibility for constructing the main distribution, and Bandung City Water Company provided further branch distribution and household channels.

5.5.2 Timeline for Construction Projects

The following discussion is on organisational processes during the construction of the first phase of the South regional water supply system in Metropolitan Bandung. The overview of the overall timeline in this section is followed by an in-depth analysis of each related project.

Overall, the construction works were conducted in seven years between 2012-2018 (see Table 5.1). The Head of the Technical Planning of Water Supply²⁸ estimated that the system should be completed within two years. She said, “From the past experience, since 2009, construction of water supply infrastructure for 350 litres/second and the same lengths of the pipeline network (as installed for the South System) should not take more than two years. However, this construction involves multi-stakeholders with different thoughts. Moreover, the dynamics in each organisation, i.e. central government, provincial (government), and city/regency are not the same and cannot be generalised. Indeed, it is a challenge in regional water supply development.”

Considering the above statement, the setup target to finish the South System to achieve the MDG target by 2015 should have been achievable. However, due to delays in completing projects and the time lag between one project and another, the system was opened by the Governor of West Java on 10 January 2019. Therefore, the overall delay was four years compared to the expected target of 2015. The detail of the delay can be seen in Table 5.1.

Table 5.1 shows that there were at least four times when there was no construction work since project inception in March 2012, i.e. at the beginning of 2013, 2015, 2016, and 2017. From these gaps between projects, there was 18 months delay in total. Therefore, the rest is delay or time spent completing projects which should have been completed sooner. According to Shiferaw and Klakegg (2012), projects that are not completed on time indicate weak and inefficient implementation of a programme. In general, Pressman and Wildavsky (1973) construct models of delay in the implementation of public policy and found three causal elements, namely the intensity of preferences²⁹ when people make a decision, the level of resources, and the degree to which negative attitudes toward a programme are present.

Also, Kolbusa (2013) identifies three most significant pitfalls during the implementation of projects which can lead to slow-moving projects, namely: a lack of clarity of the content of the goals; a lack of goal specification; and, confusion and uncertainty caused by premature action. These issues are elaborated in the analysis of the completion of each project in the following sections.

²⁸ under the Ministry of Public Works and Housing

²⁹ How intensely an individual or organisation sticks to their particular idea and position.

Table 5.1 Timeline of Construction Works of the South System

No.	Construction Projects	Length of Contract	Project Duration						
			2012	2013	2014	2015	2016	2017	2018
1.	Untreated water Unit								
1.1	Water Intake	March – Oct. 2012	■						
1.2	Transmission Box Culvert	June – Dec. 2013		■					
1.3	Transmission Pipeline	April – Oct. 2014			■				
2.	Production Unit	Aug.2013- Dec.2014		■	■				
3.	Main Distribution								
3.1	Main Distribution Phase I	May-Dec. 2013		■					
3.2	Main Distribution Phase II	July – Dec. 2014			■				
3.3	Main Distribution Phase III	Aug. – Dec. 2015				■			
3.4	Main Distribution Phase IV	March – Dec. 2016					■		
3.5	Main Distribution Phase V	June – Dec. 2017						■	
4.	Branch Distribution & Service Unit	The whole year 2018							■

5.5.3 Detailed Engineering Design

A detailed engineering design (DED) is the technical reference for construction work, in the form of detailed engineering documents for each sub-system or component of an infrastructure. Most of the DEDs for the construction work of the South System were prepared one year before construction, by the respective institutions executing the construction project.

During the completion of projects, some DEDs need to be reviewed just before before the construction is executed. Such cases also delay the completion of the infrastructure system, for example because of a change in working method, or the need to make a new DED due to a change of location. An example of the first issue occurred when constructing the main distribution units, when the original DED for installing the

main distribution pipeline was reviewed due to a change in the method from an open cut to horizontal directional drilling method.

This in turn was because the open cut caused disruption to local road traffic, leading to objections from the people impacted by the process. The official from Water Supply Division from West Java Province said, “We used the open cut method in 2013, but because the road is narrow, it was ‘noisy’ and so the permit to run the project was taken away by the Road Development Agency in Bandung Regency. As a result, the rest of the project stopped and reached only 20% progress in 2013. It continued in 2014 with the new drilling method.”

5.5.4 Raw/Untreated Water Unit

Raw or untreated water units are the facilities and infrastructure for taking and supplying untreated water. The facility includes a water storage building, pumping systems, and building for distribution facilities and equipment. The Directorate General of Water Resources constructed the raw water unit for the South System under the Ministry of Public Works. For the first phase of the South System, untreated water is taken from the River Cisangkuy in Bandung Regency, backed-up by the supply from the Cileunca Reservoir (see Figure 5.1). Besides supplying untreated water for domestic use, the intake unit is also used for hydropower. Furthermore, this intake will support all phases of the South System.

There were two issues concerning the development of this untreated water unit: the construction time was too early and there were time gaps between one sub-project and another. As can be seen from Table 5.1, the construction of the untreated water unit started with the development of water intake from March to October 2012. This was before the cooperation agreement between central, provincial, and local government was signed. This situation closed off other options which might have been better than the planned one. An official from the Water Supply Division in West Java Province said, “Conducting construction before discussion on the tariff was settled gave us no choice but to continue the development process of the South System.” This reveals the weaknesses in the coordination between the implementers of the project due to the absence of a leader.

The second issue on the gaps between the three construction projects took place between 2012–2014. As can be seen from Table 5.1, there were two gaps, i.e. five months from January–May 2013 and three months from January–March 2014. Therefore, there were eight months without construction work on the raw water unit.

Such gaps could have been avoided if the contract for constructing the untreated water unit had been set up as a multi-year project to avoid multiple procurement processes.

5.5.5 Water Production Unit

Production units are the facilities and infrastructure which turn untreated water into drinking water. The project execution was planned to start in early 2013, but the choice to set up the contract as a multi-year project required longer as a bureaucratic process for the budgeting process. The work was completed in West Java Province, under the Directorate General of Human Settlements, Ministry of Public Works.

An official from the Working Unit for Water Supply Development³⁰ based in Bandung said that the construction of the water treatment plant “was planned in 2013–2014. It started late because there was a need to discuss whether to do it under a multi-year contract.” However, as a consequence, there was no time gap during the construction of all the components of water production unit (see Table 5.1). This experience shows the option, to be decided for respective projects, of whether to make more effort to prepare the project in advance or have more delay during its implementation.

The other issue in constructing the water production unit was land provision, as the land that had initially been prepared was not used due to technical issues. Unfortunately, there was no road access to the new land, and so time was taken to construct road access before the water treatment plant and its reservoir could be constructed. An official from the Working Unit stated, “There was a shift to another area different from the previously prepared land. When the contract with the developer for water treatment plant was signed, the land was without road access, and we needed to prepare the access first. Therefore, although the contract was signed in August 2013, the actual construction started in November 2013.”

5.5.6 Main Distribution

The main distribution pipeline was constructed by the West Java Provincial Government through the Agency of Human Settlements and Housing. This is the pipeline network which carries treated water in significant amounts, so-called bulk water, from water shelter or reservoir buildings through a further branch network towards the service units. An official from the water supply division in the West Java

³⁰ Under the Ministry of Public Works and Housing.

province said, “The main distribution took the longest period to finish because the budget allocation was also the biggest. We will finish [the main part] this year [2016], and next year we will connect and make it closer to the existing system.”

Construction of the main distribution for the first phase of the South System was planned to be completed within three years, but it took five. The causes of delay were varied, but generally because of the objections from local people concerning the construction works, the change of working method, the change of pipeline route in Bandung City, and the adjustment of the dimension of the pipe due to incompatibility with the existing pipe belonging to the water supply company in Bandung Regency.

As outlined earlier, the objection from the local people in 2013 was because of the disruption to road traffic. Since most of the pipeline network was installed down narrow village roads, the local traffic was disrupted, leading to a change in the effective method from open cut to horizontal directional drilling, implemented in 2014. Besides delaying the project, the change in process also contributed to the delay in completing the whole programme.

Another issue was due to a request from the Water Company of Bandung City to change the meeting point between the main and branch distribution. A planning official from Bandung City Water Company said, “Since the previous projects were delayed for years, we then reviewed the service coverage and the current DED. We decided to shift the planned service area utilising the supply of the South System from Buah Batu area to Mohammad Toha”. This change led to the additional pipeline being extended from the originally designed intersection, requiring more time and contributing to the delay.

As also outlined earlier, the construction of the main distribution projects was not set up as a multi-year project. The decision to choose an annual contract instead was inefficient at the time since it caused time gaps between construction work for 19 months overall. Table 5.1 shows that there were four delay times, i.e. between January–June 2014, January–August 2015, January–February 2016, and January–May 2017. Most of the time gaps were due to procurement processes.

5.5.7 Branch Distribution and Service Unit

Branch distribution is the pipeline network connection of the water supply from main distribution to service units. The service unit is where a point of water can be taken, which consists of direct connections to households, public hydrants, and fire hydrants.

The branch distribution and service units were installed by the Bandung City Water Company.

The delay of around three years from the previous construction work led to the need for an internal review of the Bandung City Water Company regarding the planned service area, because there were changes in priorities within the three years due to the changes in the supply or level of service in the area of Bandung City. The outcome from the review was a suggestion to shift the meeting point between pipelines from branch distributions with the pipeline from the main distribution, which was constructed by the provincial government.

A planning official of Bandung City Water Company said, "The connection between the main distribution and branch distribution for Bandung City was started in September 2018. After the construction of the branch distribution, some tests were conducted to make sure everything worked well before the system was utilised for public services." The complete water infrastructure was then opened by the West Java Governor on 10 January 2018 (Hutapea, 2018).

5.5.8 Appointment of Operating Management

The particular management unit will carry out water utilisation, the operation of the system, and its maintenance when the whole infrastructure and supporting facilities are in place and ready to be operated. Based on the MoU between all parties, the Governor of Java Province appointed an operator named Tirta Gemah Ripah. Bandung City Water Company also prepared a particular unit to manage services with the water sources from the regional water supply.

The work of this particular operator was beyond the cycle of the water supply programme since they will work after the outcome of the system, the water flow to household level, is achieved. However, their role is essential in terms of giving a view on how the future elements of the programme should be conducted, especially for the second phase of the development of the South System.

5.5.9 Monitoring, Control, and Evaluation

Monitoring in a programme context is a continuous assessment of the extent to which a programme is implemented as designed and serves its intended target group (Kettner *et al.*, 2008). This continuous assessment of the South System did not occur, although the central and provincial governments have the right to conduct monitoring

and evaluation of programme activities. The programme monitoring relied on personal communication. This situation led to weak control over the progress of programme implementation.

Sowden (2011) underlines that programme control should be established at the earliest opportunity, with assurance arrangements being defined in the programming mandate and further developed in the programme preparation plan. He furthermore emphasises that the deployment plan for monitoring and control strategy is embedded within the programme plan, which sets out how the programme will be controlled internally.

Similar to monitoring, evaluation should be conducted at every stage of the physical development process. The purpose of the evaluation is usually to discover if the plan is being implemented, and if so, how it performed or what its effectiveness was (Baer, 1997). The evaluation of the plan was not familiarised in the case of the development of the South System's regional water supply. When I asked an official from the provincial water supply division whether there had been regular monitoring from central government, he said, "Meetings were held incidentally to discuss the current issues. Meetings to discuss technical issues usually took place here in the Agency. For coordination issues, the meetings were usually held in Satay Building [the office of the Governor] coordinated by the Bureau of Regional Autonomy and Cooperation."

As discussed earlier in Section 4.5, the current report on monitoring and evaluation is more on the physical progress and financial disbursement of each project in a single fiscal year. No report is required to show the extent to which a programme is progressing, what risks are faced in the field, and how risks should be managed. Kettner *et al.* (2008) suggest that when conducting a programme, evaluation should be concerned with user feedback on policy and planning purposes, including the assessment of programme results (outcomes) and the determination and measurement of programme impact. Nevertheless, this cannot be conducted until the infrastructure system is fully functioning. This is a potential topic for future research.

5.6 Analysis of Organisational Structure

As discussed in the first chapter, besides focusing on business process, this thesis also gives attention to organisational structure. This section structures the relationships

between related organisations based on their involvement, whether in the planning stage, construction work, evaluation, and so on.

This research identified ten institutions involved in the planning and implementation of the water supply programme for the South System in Metropolitan Bandung. These institutions are from central, provincial, and Bandung City governments, Bandung City Water Company, and Tirta Gemah Ripah as the managing operator for the Metropolitan system.

Table 5.2 shows the difference in involvement level between organisations. The most involved organisation was the Housing and Settlement Agency of the West Java Provincial Government, as it was involved in almost all organisational processes except operating the built infrastructure system. The other institutions with intense involvement were the two Directorate Generals from the Ministry of Public Works and Housing, and the Planning Board of West Java Province. Both institutions were involved in most processes such as policymaking, planning, and budgeting, and monitoring and evaluation of the programme and projects.

Table 5.2 Organisational Settings and Involvement in the Programme

No.	Institution	Involvement								
		Needs Assessment	Policy	Plan- ing	Prog- ram- ming	Bud- geting	Cons- truction	Moni- toring & Evalu- ation	O- pera- tion	Coor- dina- tion
1.	National Planning Board	-	✓	✓	-	-	-	-	-	-
2.	Ministry of Finance	-	-	-	-	✓	-	-	-	-
3.	Directorate General of Water Resource	✓	✓	✓	✓	✓	✓	✓	-	-
4.	Directorate General of Human Settlements	-	✓	✓	✓	✓	✓	✓	-	-
5.	West Java Provincial Planning Board	✓	✓	✓	-	✓	-	✓	-	-
6.	Provincial Housing & Settlement Agency	✓	✓	✓	✓	✓	✓	✓	-	✓
7.	West Java Provincial Secretariat	-	-	-	-	-	-	✓	-	✓
8.	Bandung City Government	✓	✓	✓	-	✓	-	-	-	-
9.	Bandung City Water Company	✓	-	-	✓	✓	✓	-	✓	-
10.	PT. Tirta Gemah Ripah	-	-	-	-	-	-	-	✓	-

The other institutions had less involvement or an exclusive responsibility. For example, Tirta Gemah Ripah, as the operator of the built system, only has this role. Also, the Ministry of Finance was involved only in the budgeting process for projects conducted by central government institutions.

As outlined earlier, the regional water supply programme has neither a programme manager nor programme management office. An official from the provincial water supply division said, "No, there is no programme management office. It is not established as an institution." This office is nevertheless essential to control work processes and deal with potential risks, such as delay in completing projects, and at programme level more generally.

5.7 Conclusion

As mentioned in the introduction, this chapter aimed to identify challenges facing the current water supply development system in Metropolitan Bandung as one of the research objectives. Numerous challenges have been identified from the discussion in this chapter.

The most obvious and main problem raised by this research was addressing the delay in completing projects and programme. Indeed, delays happened in almost every project. However, analysis of the organisational work process of the regional water supply development in Metropolitan Bandung shows some space for improvement to avoid prolonged delay.

Learning from the experience in Metropolitan Bandung, three main points can be identified as the causes of risk, namely dealing with the acceptance of local people, organisational interdependence, and bureaucratic processes. The key point to minimise risk, including delay, is from the planning processes and other preparation activities that need to be carried out correctly.

Approaching local people to accept a proposed programme will bring more significant benefits and should be conducted during the planning process. When the work processes are focused on executing physical projects by undermining the planning process, this kind of risk is not captured in advance and can be met while implementing a programme. This situation threatens the continuation and completion of a programme.

The water supply programme did not follow a regular work process, as admitted by an official from the water supply division in the provincial government. He said, “Yes, the staging was like jumping here and there, skipping some processes. However, this should be understood because the regional development for Metropolitan Bandung is one of the first to promote regional cooperation for water supply in Indonesia, besides two other regions.”

Choosing the correct type of organisational interdependence, whether parallel, serial and so on, is also essential as part of programming. This research reveals that parallel integration as applied to the South System left significant holes, where there was a long time without construction work. This is also part of programming, especially when formulating a project schedule, to make the work progress efficiently.

While in the programming stage, the possible length of particular processes should be identified. There should be an analysis of whether to use a certain method compared to another, such as to set a project as a single or multi-year project, which relates to the budgeting and procurement process. In addressing this issue, a Planning Director in the Directorate General of Human Settlements said, “We are now encouraged to use a working method, the so-called Design and Build Mechanism. So, there will not be separate design and construction projects. We will not formulate the design or feasibility study and then stop to conduct procurement before the construction work. With the Design and Build mechanism, there will be only one procurement process instead of two or more.”

The issue of the lack of immediate response was also discovered through the experience of Metropolitan Bandung. The first project delay should be studied to find the cause so that lessons can be learned for subsequent projects. Unfortunately, this did not happen in the water supply programme for the South System. Project delays kept being repeated until the fifth project had the same problem.

The absence of a programme management office was also a disadvantage for the programme. As a consequence, the programme organisation could not respond to the change correctly, especially during the implementation stage. The informal relations between individuals were not enough to attain synergy in organisational processes and organisational structure.

Depart from the identified challenges in this chapter, the next chapter structures and analyses them as the basis on which to examine an effective approach for the water supply programme in Indonesia. The goal is to have an effective approach to address the lack of organisational synergy in the water supply programme in Indonesia.

CHAPTER 6

EXAMINATION OF THE PROPOSITION

CHAPTER 6 EXAMINATION OF THE PROPOSITION

6.1	Introduction	195
6.2	Analysis of the Challenges and Advantages.....	197
6.2.1	Overview of the Strengths, Weaknesses, Opportunities, and Threats	197
6.2.2	Challenges from Weaknesses and Threats	198
6.2.3	Advantages from Strengths and Opportunities	200
6.3	The Complexity of the Water Supply Programme.....	201
6.3.1	Analysis of Programme Classifications.....	201
6.3.2	Analysis of the Scope of Work.....	203
6.3.3	Analysis of the Elements of Integration.....	204
6.3.4	Analysis of Project Interdependency	205
6.3.5	Analysis of the Need to Work Together	206
6.3.6	Analysis of Priority Level	207
6.4	Identification of the Requirements for the Water Supply Programme in Indonesia.....	208
6.4.1	The Needs for Synergy	208
	<i>Synergy Challenge</i>	208
	<i>Achieving Synergy</i>	210
	<i>Synergistic and Non-Synergistic Organisations</i>	210
6.4.2	The Need for a Programme Approach.....	211
6.4.3	The Needs for Spatial Concern	213
6.5	Examination of the Spatial-Based Programme Approach	214
6.5.1	Main Issues to Address	215
6.5.2	Overview of the SBPA.....	216
	<i>Advantages of the Programme Approach</i>	218
	<i>The Spatial-Based Programme Approach</i>	220
6.5.2	Alternative Management Concepts.....	222
	<i>Strategic Management</i>	223
	<i>Portfolio Management</i>	223
	<i>Multi-Project Management</i>	224
6.5.3	SBPA as the Selected Approach	224

6.1 Introduction

This chapter aims to achieve the third research objective in selecting a proposition to address the problems of water supply development in Indonesia. The conclusion on the chosen proposition is discussed in the last section, by considering the identification of the requirements in managing water supply in Indonesia and alternative management concepts.

Before making the decision, two primary analyses are discussed as the basis for choosing a more convincing approach. Firstly, the section analyses challenges and advantages from the experiences of Metropolitan Bandung. This analysis utilises the SWOT method to structure the findings in Chapters 5 and 6. Secondly, the analyses of the complexity of the water supply programme in Indonesia. This second analysis uses the previous findings, and frames these against the literature on the organisational structure of a programme.³¹

6.2 Analysis of the Challenges and Advantages

Analysis of challenges here derived from the weaknesses and threats and the advantages are from the strengths and opportunities. Structuring the findings from the external and internal standpoints, as the advantage of SWOT analysis method, is essential to formulate a strategy to address problem with a complex organisational processes and structures such as water supply development in Indonesia.

6.2.1 Overview of the Strengths, Weaknesses, Opportunities, and Threats

Table 6.1 below lists the identified strengths, weaknesses, threats, and opportunities from the regional water supply programme in Metropolitan Bandung. Since this research seeks to arrive at a proposition for national application in Indonesia, the lists are focused on the main issues that are likely to affect the future water supply programme in Indonesia.

For example, the list does not include a weakness due to the absence of the regional water supply programme in the current spatial plan. This is because of the

³¹ Discussed in Section 3.5.

new regulation from early 2018,³² which mandates the inclusion of a water supply programme comprised of more than one local government administration in future provincial spatial plans. Assuming that the regulation is followed, the current weakness is not also regarded as a weakness for future programmes.

Table 6.1 Challenges and Advantages of Water Supply Development in Metropolitan Bandung

Strengths	← Advantages ← → Challenges →	Weaknesses
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Legalised by Presidential Regulation from 2018 <input checked="" type="checkbox"/> Lessons learnt from the previous similar programme <input checked="" type="checkbox"/> Willingness to apply programme and spatial approaches <input checked="" type="checkbox"/> The strong informal organisational structure 		<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Negative attitude over the programme approach <input checked="" type="checkbox"/> Underestimation of planning and other preparation works <input checked="" type="checkbox"/> Overlooking of the synergy of one sector programme <input checked="" type="checkbox"/> The absence of a programme management office
Opportunities		Threats
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Pressing need for additional water supply <input checked="" type="checkbox"/> Water supply as a government priority programme <input checked="" type="checkbox"/> A regulation to include regional water supply development in the Provincial Spatial Plan <input checked="" type="checkbox"/> Stronger roles of auditors to assess consistency between planning and budgeting 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Possible budget cut <input checked="" type="checkbox"/> Potential objection because of negative externalities <input checked="" type="checkbox"/> Lengthy bureaucratic process 	

The following discussion starts with the analysis of the challenges taken from the weaknesses and threats. It is then followed by analysing the current advantages from the internal strengths and external opportunities. Further, this analysis is used to identify the requirements of managing water supply development in Indonesia, and to examine the most convincing approach for it.

6.2.2 Challenges from Weaknesses and Threats

Pressman and Wildavsky (1973) identify negative attitudes regarding programme approach as one of the main causes of delays, and this one of the main issues addressed in this research. The level of negative attitude is significant in terms of how much a particular individual, organisational, or political interest detracts from the efficiency and effectiveness of achieving the programme goal.

³² Minister of Agrarian Affairs and Spatial Management Regulation.

This case occurred during the implementation of water supply development in Metropolitan Bandung, for example, when constructing a raw water unit and the main pipeline distribution. This was related to the preference of the organiser of the project to split their project into sub-projects with multiple 3–4 months procurement processes conducted each year.

As a consequence, there were 27 months without construction work, i.e. eight months when constructing raw water units and 19 months when installing the main distribution. The signs of delay can be seen from the first procurement processes, and were repeated without any action to avoid or reduce them. This case should be able to avoid if the project organisers have arranged the work as multiyear projects, which only need one procurement process.

This issue is evidence of the weak analysis of the project and programme schedule, and more generally this is a sign of a lack of preparation. In the national context, an Administrator in Water Supply Division³³ said, “Preparation work for water supply development tend to be undermined. This is the unfortunate nature of the sectoral division, which is the lack of preparation. They tend to directly execute projects and solve future problems by doing them at the same time while the projects are on-going. In fact, preparation is essential to smooth implementation.”

One of the issues is that the government, such as the Ministry of Public Works and Housing, tend to overlook programmes which involve only one sector. The ministry prefers to give more attention to multi-sector development. A Planning Director in Directorate General of Human Settlements said, “In 2018–19, I have emphasised that sectoral colleagues should have one programme that can be integrated at the provincial level. However, a big project such as regional water supply cannot be integrated with another sector.”

As a consequence, there is a lack of understanding and guidance in conducting a programme that comprises only one sector. An official from the water supply division in West Java Provincial Government said, “The staging is all over the place (not in the correct sequence). This was because the regional system in Bandung is a new practice. For instance, we had a process earlier than expected when the Directorate General of Water Sources constructed the raw water unit. This confusion was because we did not have the same concept of the regional programme.”

³³ Under the Ministry of Public Works and Housing.

The absence of a programme management office has meant the problems of delay cannot be mitigated or reduced, even though they were evident from the beginning. The risks were not managed properly. The official from water supply division adds, “We did not conduct risk management. We are not there yet to include a systematic risk identification and so on.”

The challenges from internal organisations were added to those from external factors, and the lengthy bureaucratic process was one such factor. The resistance to this lengthy process has made two projects mentioned earlier avoid the process of being multiyear projects, even though these are more advantageous.

Another challenge to the continuity and efficiency of the regional water supply development is from the budget cut. Though water supply is the development priority, a lower national revenue might lead to a suspension of projects in order to deal with the national budget deficit. When the need to fill the deficit is significant, then physical development would be the target to cut since most of the expenditure in this type of projects. With the fact that the regional water supply programme is running for more than one year, the threat is more prominent.

6.2.3 Advantages from Strengths and Opportunities

Besides challenges, the research on the experience of Metropolitan Bandung has discovered certain advantages from the internal (strengths) and external factors (opportunities). These advantages can potentially support the goals for a more effective and efficient water supply programme in the future.

The issuance of a Presidential Regulation in 2018 regarding a Spatial Plan for the Bandung Basin Region, which implicitly mandates the implementation of the regional water supply system in Metropolitan Bandung, strongly supports the implementation of such a system. An official from the water supply division said, “The development of a regional water supply system is not included in the provincial spatial plan. It is in the Presidential Regulation of Bandung Basin. This is not only for water supply, but also for waste disposal and so on. It should have been issued in 2016 but for a long time there was no news about its progress.”

The future water supply programme, especially the regional water supply, should be more effective and efficient in its management. The lessons learnt should give a significant input as the basis to improve planning, and when managing implementation. Based on the previous experiences, an infrastructure planning lecturer from an institute

in Bandung was optimistic that a provincial government, especially the West Java Provincial Government, could manage the development of water supply appropriately. She said, “West Java Province can coordinate the local governments. It will not be difficult since cooperation models have been researched, and they can make use of their experiences from the past.”

The formal organisational structure receive support from the strong informal organisational structure between individuals. From the experience of Metropolitan Bandung, the informal relationship between involved individuals helped the coordination between organisations. Although this cannot replace the role of the formal organisational structure, the friendships built between individuals in and out of the office helped the programme complete, albeit slower than expected.

The pressing need for additional water supply can be regarded as a positive force pushing the government to prioritise water supply in their programme and budget allocation. The future regional water supply has a strong back up because of a ministerial regulation that gives them the mandate to include it in the provincial government spatial plan. A stronger role of auditors to assess consistency between planning and budgeting should also be another advantage to emphasise the necessity of thorough preparation and efficient implementation.

6.3 The Complexity of the Water Supply Programme

Understanding the complexity of the regional water supply development programme is essential to identify an effective approach for a complex programme of water supply development. Some characteristics of the programme that it is necessary to discuss are the programme scope and classification, elements of integration project interdependency, and the need to work together.

6.3.1 Analysis of Programme Classifications

From the classification of programme typology by Ferns (1991),³⁴ i.e. strategic, business cycle, and single objective programmes, the water supply programme can be classified as a single objective programmes. This is because the programme is operated across an organisation with a single objective, to provide additional water supply.

³⁴ Elaborated earlier in Section 3.5.1.

The water supply programme in Indonesia cannot be classified as a strategic programme since Ferns (1991) defines it as a programme which has an impact within one particular organisation on their organisational structure, strategies, and policies. Additionally, it is also not a business cycle programme since it goes beyond the annual planning and budgeting cycle.

Using the programme typology elucidated by Ferns (1991) for the regional water supply in Indonesia, it is important to stress that the programme should be correctly managed as a multi-organisation programme, and beyond the annual budget cycle. However, at the same time, the focus remains to achieve a single objective to provide additional water supply effectively and efficiently.

Considering the programme typology by Sowden (2011), i.e. vision-led, emergent, and compliance programme, the regional water supply programme can be classified as a vision-led programme, because the vision is clearly defined and supported by the cross-functionality of the organisation's operations, although the political priorities are different between the levels of government. A planning Director under Directorate General of Human Settlements said, "The budget allocation for the regional water supply system is relatively on track from the central government because it has been one of our priorities." However, a planner in the National Planning Board stated, "We are still struggling to make water supply a priority (at provincial and city level) when it comes to a budget discussion with the provincial and local parliament."

Although it is quite clear that the regional water supply programme is a top priority, the programme was not managed correctly. An official from Bandung City Water Company said, "So far, we have run our projects independently. Communication is based on our relationship. It is wrong. There is a need for a regular meeting, so the progress is clear, and everybody knows what has been done by others so that we can prepare when our turn comes. We have no programme management unit!"

The statement above shows there is no coordinator under the framework of a programme. Gray (1997) would classify this type of programme without a strong coordinator or manager as a "loose programme", rather than an intermediate open or a strong programme. The loose programme has no managing role in synergising all the activities and actors. The flow of information between actors is merely to report, and there is no follow-up to respond to a situation. An official from the water supply division in West Java Province said, "We have no particular written mechanism for monitoring and evaluating the regional water supply programme. Progress monitoring from the central government is through our office not directly to the field. They can contact me whenever they want."

Also, at the provincial level, there is no particular system for regular progress monitoring. Likewise, there was little evaluation of what had been done, in order to speed-up the progress even though it was far behind the expected finishing time. An official from the water supply division added, "Personnel from the West Java Provincial Planning Board [Bappeda] visited the project site only when the construction had been completed".

With the disadvantage as a loose programme, the future programme should be coupled with a strong development control in the framework of a synergising system. This is part of the effort to translate a clear vision, as a vision-led programme, into operative technical and administrative guidance.

6.3.2 Analysis of the Scope of Work

Utilising the classification of the project by Flyvbjerg (2014), regional water supply in Metropolitan Bandung can be classified as a large-scale programme. This is because the programme has taken many years to develop, involves multiple public and private stakeholders, and impacts thousands of beneficiaries, at around 18,000 households.

Considering the large-scale and complexity of the programme, water supply infrastructure development should be treated effectively and efficiently. Otherwise, as experienced from the first phase of the South System, there will be at least four years of delay compared to the 2015 MDGs target.

The diagram of organisational processes for physical development,³⁵ shows that there are extensive work processes for physical infrastructure, including water supply development. In order to carry out the implementation of water supply development, the Indonesian Ministry of Public Works and Housing issued a ministerial regulation (MoPWH, 2016). The regulation aims to regulate the processes in managing water supply system development, including for a regional system, from planning to evaluation.

The head of technical planning for water supply said, "We have formulated guidelines to deliver the water supply programme. There are particular sequences in the processes. Normatively, we try to follow the process, although practically it is possible to work in parallel. However, the important thing is that we always work according to the rules, even when we work in parallel." Additionally, besides regulating

³⁵ See Figure 3.12 page 88.

the processes, there are various readiness requirements that need to be prepared, especially for a bigger system such as regional water supply infrastructure system (MoPWH, 2016).

Considering the large scope of work and the importance of each process in planning and implementing water supply development, as well as learning from the experience of Metropolitan Bandung, it is highly risky to have particular processes skipped or not conducted in the correct sequence. For example, one of the risks for the water supply development in Metropolitan Bandung was the lack of the regional water supply programme to be discussed in spatial planning processes. This lack affected people due to the disruption to local traffic, and led to their objections. As a consequence, it delayed the completion of the programme.

Therefore, thorough regulation, coupled with a strong development control, is necessary to guide the water supply development in Indonesia to be more effective and efficient. This can be achieved by adopting an effective approach not only to address the management system but also beyond the programme to ensure that the threats from external factors are mitigated, in order to take full advantage of potential support.

6.3.3 Analysis of the Elements of Integration

Davidson and Lindfield (1996) identify four elements of the integration of two or more organisations, namely institutional, technical, financial, and spatial integration. These elements of integration are relevant in the context of water supply infrastructure development and should be considered when employing an approach and formulating more technical regulations and guidelines.

Institutional and financial integration are required for organisational synergy, while technical and spatial integration is necessary for physical development. Since the development of the water supply in Indonesia, especially for the regional system, involves more than one institution with budget discretion, institutional and financial integration is vital to form efficient working processes. An Administrator in the Water Supply Directorate said, "We are now reviewing the business process for the regional water supply development. Moreover, also for networking, to support the work flow....the challenge is that we do not have a rule of thumb that we can learn from."

Technical and spatial integration is also essential to ensure that the system is completed correctly to have the capacity to produce the desired output and outcomes. Since water supply infrastructure development involves several projects conducted by different institutions, and these have to be integrated, technical integration is essential. Water intake and water treatment plant units constructed by the Ministry of Public Works have to be integrated with main distribution pipelines installed by West Java Provincial Government. Further, the system would not be able to function if it is not connected with the branch and household connection prepared by Bandung City Water Company.

In support of the technical integration, since the development of water infrastructure is a physical development that requires land use, spatial integration is required. The meeting points between two or more sub-systems of the water infrastructure, as discussed above, have to be at the same location. Therefore, spatial planning, coupled with a thorough engineering design, are the two essential requirements for spatial integration.

Accordingly, the adopted management system should have the vision to integrate the four elements, otherwise the risk of delay remain possible. Since the water supply programme, especially for a regional system, is likely to be carried out in more than one year, the level of integration of the four elements needs to be maintained. Therefore, it is essential to have a manager or a management office to monitor, with the authority to remind and push an underperforming organisation.

6.3.4 Analysis of Project Interdependency

The complexity of the programme can also be seen from the interdependencies between projects. The three types of interdependence, i.e. pooled, sequential, and reciprocal, developed by O'Toole and Montjoy (1984),³⁶ can be used to analyse the complexity. Besides being applicable for the analysis of organisational processes, this typology can also be applied to support spatial integration.

As acknowledged, water in the infrastructure system flows from the source to the untreated water unit and production unit, and ends in the service unit. Nonetheless, construction does not necessarily follow this order. An administrator in the Water Supply Directorate said, "Technically, construction can start anywhere as long they are connected as a system and functioning. Here, a detailed engineering design is essential."

³⁶ Discussed in Section 3.5.3.

Accordingly, the water supply programme can be classified as sequential-reciprocal, where the first element or the project can start their work in parallel.³⁷ Unlike the simple linear type, where the latter project needs to wait until the earlier project has been completed, the sequential-reciprocal focus is on operating interdependence to produce the intended outcome at the end of the programme.

Nevertheless, the related organisations must have good coordination in connecting their respective output, and so it is required that both the connecting sub-system and its outputs are compatible. For example, when connecting pipes for the main distribution and branch distribution, the material and dimensions of pipe for both purposes should be compatible to make precise connections.

Additionally, there should always be a potential contingency in sequential interdependence, because each position may need to be adjusted in case any fails to meet expectations. This happened in Metropolitan Bandung at some points when connecting the pipelines. One of the officials from the Water Supply Division said, “There was a problem when setting the connection between the main pipeline distributions with the existing network in Bandung Regency. Their existing installed pipeline could not take the same pressure as in the main distribution, and therefore it needed more time to be adjusted.”

In order to formulate an efficient interdependent scheme, a thorough analysis is needed by including a spatial aspect. The infrastructure system should be drawn on a detailed map, as a part of its Detail Engineering Design, so that the exact meeting point between two sub-systems can be observed by the two project managers. This should be coordinated and managed by a programme manager.

6.3.5 Analysis of the Need to Work Together

The previous discussions in this section have indicated that the development of water supply in Indonesia inevitably requires team work. In order to be efficient and effective, projects or organisations must be coordinated correctly.

Thompson (1967) developed a typology of coordination, namely by standardisation, a plan, and mutual adjustment. From the experience of Metropolitan Bandung, which relied on mutual adjustments and led to four years of delay in completing the whole programme, the future programme must not fall into this type of

³⁷ See Figure 3.18 page 98.

coordination. Similarly, since coordination by standardisation requires a stable independent system and is mostly for routine activities, water supply development in Indonesia should fall under the coordination by the plan.

The plan should be used for the development programme of the water supply to coordinate the joining organisations and utilise potential resources based on a pre-established plan, schedule, and procedure. These should be used to avoid disconnection or delays in connecting physical components, and thus inefficiency and ineffectiveness of organisational processes can be avoided.

However, although the water supply programme cannot rely on coordination by mutual adjustment, it is helpful. When the situation is more dynamic, and many unpredictable conditions happen, mutual adjustment is needed. This happened in the case of Metropolitan Bandung, as when there was a lack of clarity and certainty on the programme and project timelines, these were substituted by mutual informal coordination led by influential personnel.

Indeed, the programme was completed in the end, but with four years of delay. It is not sufficient to develop synergy by relying on personal relationships but without proper plans as the basis for coordinating projects. Therefore, to achieve synergy, as the basis of efficient teamwork, the development of regional water supply in Indonesia needs stronger coordination and integration based on plans and extensive programme management.

6.3.6 Analysis of Priority Level

The priority level of a programme³⁸ should affect the mind-set and attitude of the involved organisation and individual. The more important and urgent the situation and need, the more attention and priority should be given to the programme.

As a basic need, domestic water provision should be categorised as an important programme, and service coverage is on the level of high urgency. Accordingly, considering the pressing need for safe potable water, the development of water supply in any form in Metropolitan Bandung should be categorised as important and urgent. As a consequence, the programme should be managed effectively to achieve the desired outcomes and efficiency in using limited resources, especially in terms of time.

³⁸ The literature review was discussed in Section 3.5.5.

Additionally, according to the resistance level introduced by Secord (2003), the water supply programme in Metropolitan Bandung can be categorised as having low resistance. From the case of Metropolitan Bandung, the resistance was minimum and only due to the negative impact from a pipeline installation which disrupted the local traffic on narrow roads. The other conflict was with farming activities that used the same source as the regional water supply system, but this was resolved without disruption to the programme.

6.4 Identification of the Requirements for the Water Supply Programme in Indonesia

After understanding the characteristics of, and issues around, the water supply programme in Indonesia, and learning from Metropolitan Bandung experience, the following discussion focuses on identifying and analysing the requirements of a synergised water supply programme in future. The discussion is the basis for examining the proposition, i.e. Spatial-Based Programme Approach, compared to alternative approaches.

6.4.1 The Needs for Synergy

Analysis of the complexity of the water supply programme in Section 6.3 demonstrates that it needs to be synergised regarding manageable organisational processes and the organisational structure of the programme. This section discusses this matter, followed by the disadvantages of a non-synergistic organisation.

Synergy Challenge

Lengthy organisational processes are likely to lead to a breakdown before achieving the intended goals. Moreover, the challenges increase when they involve more individuals and organisations in a complicated relationship. Accordingly, Sandy (1991) notes the issues that prevent plans from being put into action before intended outcomes are achieved. These issues can be grouped based on process, individual and organisational aspects, and the quality of the plan document.

One of the challenges regarding organisational processes is the difficulty of linking one process to another, for example, to translate a plan into a more detailed programme with efficient project sequences. This is complex because the availability of all resources should also be considered and analysed. It becomes more complex

when one or more institution is dependent on other institutions and they have difficulties in arranging their resources, such as in allocating their budget. For example, Bandung City Water Company which is highly dependent on Bandung City government to support the company through the government's budget allocation for further investment.

More complex situations with higher risk of breakdown are likely to happen during programme implementation due to the realisation which is different to what has been committed. An official from the Water Supply Division in West Java Province said, "It is tough to 'lock' commitments. For instance, Bandung City Water Company promised to start work in August (2016), but they are only now about to start [March 2018]." These potential risks should be managed appropriately to avoid or mitigate the breakdown of the organisational processes.

For the future programme, MoPWH (2016) requires that risk analysis be included in a feasibility study. This includes risks on performance, related to politics, and financial risks. Furthermore, the regulation also requires particular individuals or organisations to manage, reduce, and mitigate risk to ensure the efficiency and effectiveness of the infrastructure development.

In addition, Sandy (1991) highlights the lack of clear roles in implementing plans as a source of problems in achieving the intended goals. This has also been a major problem in the case of Metropolitan Bandung. The lack of clarity of the programme manager on all the development processes has tended to make the projects run independently, with no clear timeline or timekeeper. As a consequence, no individual or office can control the delay.

Sandy (1991) also highlights how the content of the plan document can contribute to the gap between planning and implementation. The flaw in a planning document might be that insufficient solutions are offered, and information for action is unorganised. This matter should be highlighted when conducting development planning, spatial planning, and programme planning for future water supply development.

The issues discussed above require synergy between organisational processes and its sub-systems, more than just integration. Synergy demands attention on how to ensure the integrated system is functional and has a new capacity to deliver its outcomes. For the case of water supply infrastructure system, integrated physical system is not the end goal, but the water that reliably channelled to the end users.

Achieving Synergy

In order to avoid the breakdown discussed above, maintaining synergy is inescapable. Covey (2004) says that synergy aims to find new solutions to old problems and can produce far better results. To take advantage of synergy, Lai (1997) suggests that the adopted synergistic approach should look at the total picture before working in a particular area. The initial look at the whole picture is necessary to avoid a particular element being excluded. Additionally, Harris (1984) underlines that the issue is not just how the team functions synergistically, but how it integrates with all the involved organisations, or the society which it supposedly serves.

Synergy requires collaboration across lines of business, and it is among the most difficult of all (Liedtka, 1998). Concerning operationality, Campbell and Goold (1998: 4) suggest six types of synergy, namely shared know-how from the specific business process, shared tangible resources, pooled or joint negotiating power, coordinated strategies, vertical integration, and combined new business creation.

It is a major challenge to apply the concept of synergy while managing a water supply development programme in Indonesia, since this involves many organisational units, with their discretion in financing respective projects without any integrating system. An official from Bandung City Water Company suggested that, for the future water supply programme, “Firstly, there must be a Programme Management Unit (PMU), it is a must, and otherwise, it would cause conflict [between projects]. The PMU will be the leader. Secondly, there must be a clear timeline....the key is the establishment of the PMU.”

Synergistic and Non-Synergistic Organisations

Real synergy will occur when two entities behaving in different ways merge into a third entity that starts to behave in an entirely different way (Geneen in Liedtka, 1998). Adapting the concept from Liedtka (1998), in essence, synergy seeks to leverage the capabilities of an individual or organisation to create new institutional capabilities at a higher level.

Synergy is reflected in the extent to which the involvement and contribution of different partners improves the ability of the partnership in different ways, namely to (Lasker *et al.*, 2001: 187–188):

1. Think about work in creative, holistic, and practical ways;
2. Develop realistic goals that are widely understood and supported;

3. Plan and carry out comprehensive interventions that connect multiple programmes, services, and sectors;
4. Understand and document the impact of actions;
5. Incorporate the perspectives and priorities of community stakeholders, including the target population;
6. Communicate how actions will address community problems; and
7. Obtain community support.

In contrast, a non-synergistic organisational culture promotes a situation in which members are fiercely competitive with one another and others, where the advantage of one individual becomes a victory over another (Harris, 1981). Although Mathews (2006) underlines how a situation of negative synergy can exist whenever the whole is less than the sum of its parts, this situation is unlikely to happen in water supply development as the actors have the same vision and mission in providing additional water for people. Nevertheless, this should be noted in order to avoid failure in the future programme.

In short, it is essential to seek an appropriate approach to synergise all potential in an organisation, particularly in dealing with such lengthy organisational processes for physical infrastructure development from assessing needs and planning, to the achievement of outcomes. This is to ensure institutions are working together to achieve common goals. Additionally, it is important to be mindful that there is a possibility that efforts can lead to negative synergy.

6.4.2 The Need for a Programme Approach

There are two options of approach in managing physical infrastructure development, namely whether to consider it as a project or a programme. Identifying whether a particular development activity is a project or programme is vital, since the right management approach needs to be chosen and adopted (Bartlett, 2002). Accordingly, Bartlett (2002) provides guidance to assess whether a development activity can be managed as a project or a programme. This assessment is carried out by assessing the scope of work of the activity using questions, as shown in Figure 6.1.

For the development of a regional water supply infrastructure system, the answer to the first question Q1, “Is the change focused on a single, self-contained, main deliverable, however large or small?” should be “No”. Although the end of the infrastructure system leads to the same outcome of safe potable water, there are many

components in the programme that produce their respective output. For example, an untreated water unit extracts and deliver untreated water from the source, and a water treatment unit produces treated water as its output.

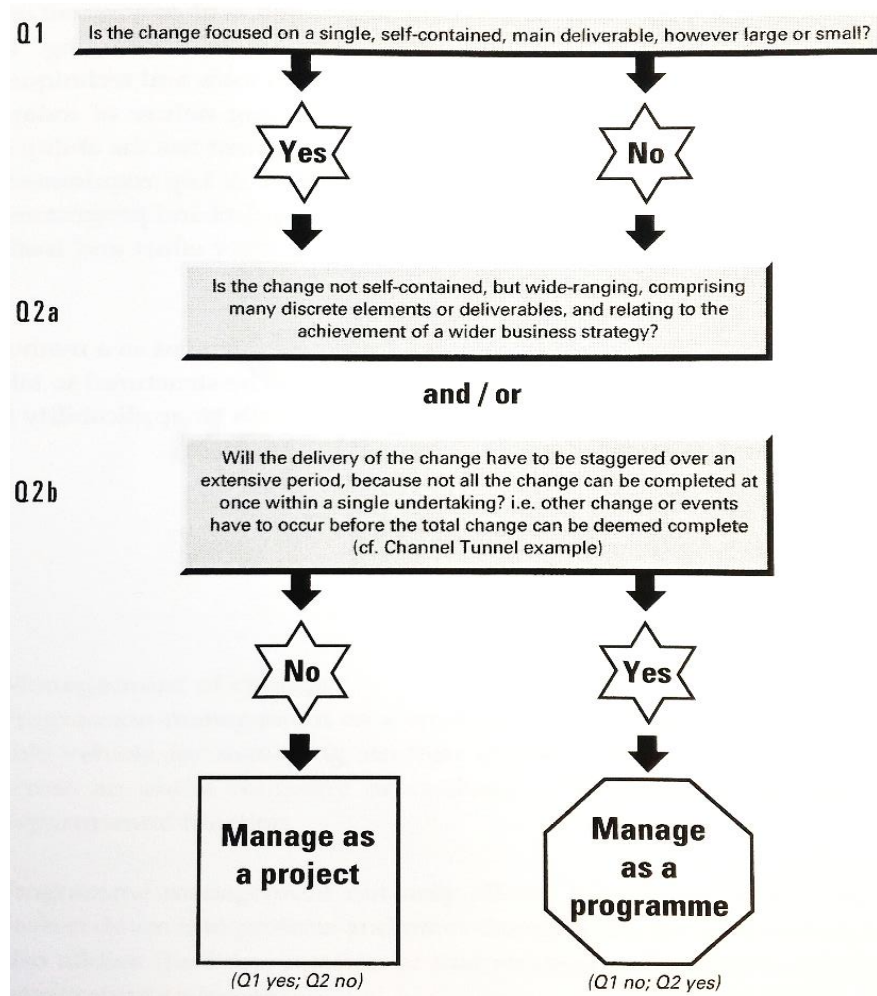


Figure 6.1 Flow Chart for Deciding on a Project or Programme

Source: Bartlett, 2002: 25

The above explanation can also be used to answer question Q2a in the affirmative. A water infrastructure development is a wide-ranging programme in terms of its sub-system and deliverables, which are likely to be conducted over an extensive period of more than one fiscal year. Also, the development of a water system is related to the achievement of a broader strategy, as considered in Q2a, such as improving public health and supporting other sectors in the region.

Regarding the issue on change process or events required, as addressed in question Q2b, it is evident that some events should happen before the total change can be deemed in an entire state. Therefore, the answer to Q2b is again affirmative, and the conclusion is that the regional water supply development should be managed as a programme, or treated utilising a “programme approach”.

There are benefits from a wide range of development activities managed through a proper programme management (Williams and Parr, 2004), namely:

- Integrated planning of multiple projects;
- Identification and understanding of dependencies;
- Management of risks relating to complex interdependencies;
- Maintained focus on the overall business benefits of the programme; and
- Coordination of large and often dispersed project teams.

In particular for the construction industry, Barnes *et al.* (2015: 4) define programme management as the management of a related series of projects completed over time, to accomplish the complete construction of individual inter-related projects punctually, within budget, and according to specifications. This kind of management approach is needed for such a complex programme as water supply development.

The limitations of project management gave birth to programme management. The latter offers the main advantage as a means of aligning, coordinating, and managing a portfolio of projects to deliver benefits which would not have been possible when the projects are managed independently (Shehu and Akintoye, 2009). In the Indonesian context, the discipline of programme management has not been developed, unlike project management.

6.4.3 The Needs for Spatial Concern

Attention to spatial aspects is vital for the development of water supply infrastructure system. In the context of infrastructure development, Davidson and Lindfield (1996) identify spatial integration as the important integration element, which is related to both technology integration and geographic or area-based integration, and is therefore deserving of special consideration. Links between different projects are only possible when they are carried out at the same location.

Spatial integration for infrastructure development requires a detailed plan and guidance, such as a spatial plan and detailed engineering based on an analysis of land characteristics. Proper planning influences development in many ways, as identified by Davidson (1996), who mentioned inspiration, a pool of commitment, guidance, and the means to control development. However, these advantages of having a thorough plan were not evident in the experience of Metropolitan Bandung.

In the case of the South System in Metropolitan Bandung, the construction of the main pipeline distribution should have been directed to another point to meet the

branch distribution. However, the meeting point was at a different intersection from the earlier informal agreement between West Java Provincial Government and Bandung City Water Company. The main reason for this issue is because there was no detailed spatial plan as a consensus to be followed by related projects.

The lack of spatial consideration for the development of the South System can be seen in the conflict with farming activities that take water from the same source. Although this issue was resolved, it shows that the programme needs to be prepared well to pay more attention to spatial aspects. Indeed, Camagni (2017) believes that a lack of spatial consideration/planning represent the appropriate institutional, technical, and policy context will threaten territorial sustainability.

Another example of lack of attention to the spatial aspect can be seen in the objections from local road users to the installation of a pipeline along a road, which had disrupted the traffic. This should have been anticipated and resolved earlier during the planning stage when there was ample time to address the issue, and not when a project was about to be executed, as experienced in the case of Metropolitan Bandung. An official from the Water Supply Division said, "An approach to the local people was made, and then people accepted the project plan, but it was different when the project was executed."

From the above issues, it is evident that the spatial concern is essential, both for the internal programme and in a broader context beyond the programme. As a tool for coordination, Koresawa and Konvitz (2001) believe that spatial planning can incorporate wider spatial consequences from decision-making. Additionally, Camagni (2017) underlines that the spatial approach features the necessity of a unitary and integrated vision of the environmental, economic, social, and cultural development processes.

6.5 Examination of the Spatial-Based Programme Approach

The earlier analysis emphasises the evidence that the development of water supply in Indonesia need to be managed in a synergised way which also considers spatial aspects. This section seeks a convincing approach with an orientation towards achieving synergy of the organisational processes and organisational structure, to accommodate the spatial aspect for more efficient and effective water supply management in Indonesia.

The discussion starts with an overview of Spatial-Based Programme Approach (SBPA) as the proposition of this research, followed by a discussion of alternative

management concepts. Several alternative management concepts from the academic literature are analysed to arrive at three possibilities, namely to accept the SBPA as it is, to modify the SBPA, or to reject the SBPA and accept another management approach.

6.5.1 Main Issues to Address

Based on the literature review, analysis of the Indonesian national development system, and analysis on the case study, there are main issues and challenges to address as follows:

- The lengthy and dynamic organisational processes for physical development with many details to anticipate (as shown in Figure 3.12).

The discussions in literature review chapter, confirmed by the analysis of the case study, reveals that the more complex the organisational processes and structure, the more possibility for the programme being prepared improperly, broken before its implementation, or incomplete implementation. This challenge should be addressed by proper and adaptive working methods.

- The complex organisational structure for water supply development, which emerged from the current national development system.

The decentralised system has brought more complexity to the development of the water supply sector. It demands more organisations and individuals to involve, which lead to a less responsive and adaptive programme team.

- More challenges to coordinate and synergise the organisation.

The earlier two issues brought more challenges to coordinate and synergise organisational processes and structures. Synergy is essential to ensure a programme to run efficiently and effectively, not merely completing the system without the new capability to deliver its outcomes to the end-users.

- Less spatial analysis.

Spatial element is essential as the basis to properly integrate all components of the physical infrastructure system on the ground. However, the case study in Bandung shows that there is less analysis on the spatial element which also contribute to delays in completing the water supply system. Therefore, the spatial analysis should be the base in every step of the physical development process, from needs assessment until the evaluation of the programme.

- Besides the challenges on the object, the other major challenge is to set the mind of involving individuals to respond to the above issues and to formulate a thorough method towards the achievement of programme goals. Additionally, it is evident that improving learning culture is also important to be more adaptive and responsive to the dynamics of programme preparation and execution.

6.5.2 Overview of the SBPA

This section gives an overview of the concept of the SBPA as a hybrid “programme approach” coupled with the “spatial element”. It is devised by this research for this research’s purposes, drawing from the literature and common concepts found in practice. This concept is explained in more detail below, and it is part of this research’s intention to relate this to the actual need for the following development of water supply infrastructure in Bandung and Indonesia in a more general, taking into consideration the lessons from the case of the first phase of water supply development in Metropolitan Bandung.

The Origin and Components of the SBPA

The term “Spatial-based Programme Approach” has been devised as an amalgamation of concepts taken from the literature and practice by this research for this research’s purposes, and is presented as an original concept thought to be helpful towards a more efficient and effective work to achieve the intended outcomes from a programme. The term Spatial-based [berbasis tata ruang] is widely used in Indonesian government to give emphasis to the development that must be in line with the existing spatial plan. In addition, the term programme and programme approach are widely used in academic literature and daily life, though in various context and connotations.

There are three components from the term “Spatial-based Programme Approach”, as follows:

1. Spatial based;

Collins online dictionary³⁹ suggests the word “Spatial” be used to describe things relating to areas. Additionally, the Cambridge online dictionary⁴⁰ defines spatial as relating to the position, area, and size of things. Thus, the word “spatial” covers all

³⁹ Retrieved from <https://www.collinsdictionary.com/dictionary/english/spatial> on 13 January 2020

⁴⁰ Retrieved from <https://dictionary.cambridge.org/dictionary/english/spatial?q=Spacial> on 13 January 2020

about the character of space or relates to the perception of relationships as of objects in space.

In addition to the definition, the Collins online dictionary⁴¹ highlights that spatial ability is the ability to see and understand the relationships between shapes, spaces, and areas. This ability would be the “base” or the foundation or starting point to develop something. Hence, from the term “spatial-based”, SBPA emphasises the spatial analysis as the starting points to consider when assessing needs, making policies, preparing and managing the programme, discussing budget allocation, and conducting monitoring and evaluation.

2. Programme;

The concept of the programme was born as a means of aligning, coordinating, and managing multiple projects to deliver outcomes and benefits which would not have been possible when projects are managed independently (Ferns, 1991; Shehu and Akintoye, 2009). Thus, the term “programme” is used to emphasise the need to synergise related projects and its organisations to gain the best advantage from the creation of a programme.

3. Approach;

The word “approach” covers underlying philosophy, working ideas and methods, and the techniques. Hofler (1983: 71) defines an approach as “the underlying philosophy or belief concerning the subject matter and point of view of the individuals concerned with their field”. Additionally, Burnham (1992: 9) defines approach as “working ideas, methods, or ways of working, and techniques or practice activities and tools”. Thus, the word “approach” covers from the philosophical aspect to the technical matters such as working methods, techniques, and tools.

Accordingly, from the terminology, the term Spatial-based Programme Approach means an underlying philosophy and methods in preparing and managing a programme which should be based on spatial analysis. In a more comprehensive, this research offers the definition of SBPA as an analytical approach to synergise organisational processes and organisational structure, by conducting efficient work towards the effective achievement of programme outcomes.

⁴¹ Retrieved from <https://www.collinsdictionary.com/dictionary/english/spatial> on 13 January 2020

Advantages of the Programme Approach

The definition of “programme” used in this research is a group of projects managed in a coordinated way to gain benefits that would not be possible when the projects are managed independently (Ferns, 1991: 149). Hence, the programme approach can generally be indicated as an approach that synergises a group of related projects to gain desired outcomes.

Wijnen and Kor (2000: 143) identify the benefits of implementing the programme approach as follows:

- Programme approach helps in striving to reach the goals. Initially, the goals might look very remote and abstract, but during the process of carrying out many dozens of projects and activities within the programme, they become closer;
- Programme approach helps direct all efforts continually towards the agreed goals. A programme must be continually managed towards the intended goals;
- Programme approach helps coordinate the implementation of all different, unique and goal-oriented activities, which include projects, improvisations, and routines. Furthermore, programme management makes it possible to bring together conflicting goals and their various activities into one programme;
- Programme approach helps in responding to changing circumstances in a flexible and controlled manner. If circumstances should change, efforts are intensified, slowed, or even stopped. In this case, the goals will undoubtedly come under discussion.

The above advantages will be achieved when activities, projects and other work are carried out connectedly, effectively, flexibly, efficiently, and quickly at each stage of the programme (Wijnen and Kor, 2000). For maximum advantage, the programme approach must start from the stage of programme planning, and remain present in all developmental stages, to consider needs/problem assessment; policy, development, and spatial plans formulation; programme management; and, monitoring and evaluation.

Additionally, Pellegrinelli (1997: 142) observes the advantages of organisations using the programme approach as follows:

- Greater visibility of projects to senior management and more comprehensive reporting of progress

While project reporting systems focus on performance against the plan or specific objectives, programme reporting can better address strategic performance by tracking progress relative to competitors;

- Better prioritisation of projects

Each project role within the organisation's overall development is correctly identified and managed, and resources can be more easily re-allocated to critical projects even after funds have been assigned to individual projects;

- More efficient and appropriate use of resources

Dedicated or ring-fenced resources, which tend to be more productive, can become cost-effective within a programming context;

- Projects driven by business needs

Project and line managers' agendas, such as the desire to apply the latest technology, utilise existing staff or fulfil personal research interests can be kept in check;

- Better planning and coordination

The incidence of work backlogs and duplication of core functionality and components can be reduced; explicit recognition and understanding of dependencies; re-engineering due to inadequate interface management with existing systems and other projects can be minimised.

These benefits from the programme approach, as described by Wijnen and Kor (2000) and Pellegrini (1997), are desired for an infrastructure programme such as regional water supply development in Indonesia. With its orientation on the synergy of the processes, from the first initiation, during all the processes, and the programme closing, efforts will be assigned to achieve set goals effectively and efficiently.

When a programme is successfully managed, these can be seen from several common characteristics, as discussed by Sowden (2011: 17–22), namely:

- Remaining aligned with corporate strategy

Once a robust programme plan has been approved, considering all the options, it should be reviewed regularly to ensure ongoing strategic alignment;

- Leading change

Seeing through a change in a programme is a leadership challenge. In addition to the need to manage a large number of complex tasks, individuals and organisations have to be led;

- **Envisioning and communicating a better future**
A clear vision is insufficient without the clear and consistent communication of it towards gaining commitment and buy-in from a range of stakeholders;
- **Focusing on benefits and threats**
The ultimate success of a programme is judged by its ability to realise these benefits and the continuing relevance of these benefits to the strategic context;
- **Adding value**
A programme only remains valid if it adds value to the constituent projects. Otherwise, it is better to allow the projects to proceed independently;
- **Designing and delivering a coherent capability**
A programme is focused on delivering a plan or blueprint that meets the needs of the organisation;
- **Learning from experience**
A programme is a learning organisation in that it reflects upon and improves its performance during its life. An organisation's ability to learn from experience often reflects its programme management maturity.

In contrary, Williams and Parr (2004: 32–33) list common symptoms when projects are delivered without programme approach:

- Not enough time is spent on planning or understanding what a project is trying to achieve, but planners proceed straight to solutions;
- There are over-optimistic or unrealistic estimates (cost, benefits, time);
- Budget cuts are made halfway through, leading to failure in completing the project;
- Timescales are moved, and it is impossible to complete projects on time;
- Activities are not integrated and coordinated effectively, causing delays;
- Unexpected issues and problems cause overruns;
- Projects deliver solutions or deliverables but no or limited business benefits.

The above points revealed by Williams and Parr (2004) are relevant to the development of the South System in Metropolitan Bandung. This is mainly related to delays, timescales being moved leading to issues with late project completion, and certain unexpected issues such objections from local people and conflict over water use with farming activities, as mentioned earlier.

The Spatial-Based Programme Approach

The current concept of the programme approach as offered by academics and practitioners covers comprehensive elements to synergise the organisational

processes and organisational structure. However, the spatial element is required for physical development to be able to integrate the produced outputs on the ground.

This spatial concern is required to complement the benefits that can be achieved by applying the programme approach with the benefits of spatial integration. The primary goal with involving spatial consideration is, as suggested by Camagni (2017), to manage territorial sustainability through spatial planning that represents the appropriate institutional, technical, and policy context.

Conceptually, the proposed approach is the Spatial-Based Programme Approach (SBPA). It is not a newly invented concept, but is rather a merging of concepts from the discipline of spatial planning and programme management. The SBPA strengthens the synergy between projects as the advantages of applying the programme approach by addressing spatial issues.

Healey (2001) argues that the complexity of territorial dynamics means it is no longer possible to think of strategies and plans being “implemented” in a linear way. This is because projects might compete and undermine each other’s viability. Hence, the role of programme approach is a means of aligning, coordinating, and managing multiple projects to deliver benefits (Ferns, 1991; Shehu and Akintoye, 2009). In short, these two approaches are complementary.

This compatibility can also be seen from the fact that such long-term programmes often take into account a strategic management perspective, organisational effectiveness, a systems view, and learning approach (Thiry, 2007). This is compatible with the aim of spatial strategies to become a frame of reference that structures and shapes the flow of action (Healey, 2001: 157).

The other common concern with the programme approach and spatial mainstream is the implementation of policy, plan, and strategy. Programmes constitute the missing link between executive-level strategy and the projects and operations that enable it to deliver value (Thiry, 2015). Similarly, the spatial approach is concerned with the translation of spatial strategies to regulatory criteria, concerning land use, development projects, and environmental quality, and embodied in the policy discourses (Healey, 2001).

The idea of SBPA also emerged from a concern to search for “a new strategic focus in spatial development policy systems”, as argued by Healey (2001: 147). The proposed approach is strategic as the means to synergise a group of related projects by considering the spatial element to gain outcomes that are unlikely to be achieved

when the projects are managed individually. The aim can be achieved by placing synergy first, to find solutions that can produce far better results than they could individually (Covey, 2004).

Promoting the spatial aspect of programme management approach also emerged from concerns over issues of coordination/integration of sectoral policies that have spatial consequences. Cullingworth and Nadin (2006) state that spatial planning aims to improve the integration of different forms of spatial development activities. Therefore, by incorporating a spatial element to the programme approach, the involved individuals and organisations consider the impact beyond the programme.

Being familiar with spatial planning will help programme managers to have concerns about various aspects, because the spatial planning approach underlines the necessity of a unitary and integrated vision of the environmental, economic, social, and cultural development processes (Camagni, 2017). Additionally, Haughton *et al.* (2010) note that, besides focusing on sustainable development, spatial planning is also concerned with social inclusion issues as part of its core rationale.

In line with the programme approach and management, spatial planning features the synergising of related individual and organisational units within the frame of planned space. Haughton *et al.* (2010: 26) argue that spatial planning brings people together to achieve aspirational goals at the site and area levels, and also contributes to broader regional and national aspirations for particular types of growth to emerge in pursuit of broader national policy goals.

Hofler (1983: 71) defines an approach as “the underlying philosophy or belief concerning the subject matter and point of view of the individuals concerned with their field”. Additionally, Burnham (1992: 9) defines approach as “working ideas, methods, or ways of working, and techniques or practice activities and tools”. Accordingly, as an analytical approach, SBPA should be embedded within an individual and organisation’s mind-sets and working methods.

6.5.3 Alternative Management Concepts

By considering the need to address synergy problems, various management approaches have been identified as alternatives to the SBPA, namely “strategic management”, the “multi-project management approach”, and “portfolio management”. The advantages and disadvantages of these concepts are compared below.

Strategic Management

Strategic management can be interpreted as a set of managerial decisions and actions of an organisation that can be used to facilitate competitive advantage and long-run superior performance over the organisations (Kong, 2008: 283). Johnson *et al.* (2008) describes strategic management activity as having three distinct elements, namely: strategic analysis, strategic choice, and strategy implementation concerned with translating strategy into action.

Wijnen and Kor (2000: 177) argue that although strategic management is a useful and worthwhile tool for managers, it is not actually designed to manage the process of strategic formation. Nag *et al.* (2007) also state that even though strategic management's success as a field has emerged from its ability to attract multiple perspectives and still maintain coherent distinctiveness, it is not so much guidance on how to manage the process and its supporting organisational units.

In short, it can be said that although strategic management has some features in strategic analysis until the translation of the strategy, it has less focus in managing and control of the organisational processes and structure. Therefore, by comparing the advantages of strategic management and the SBPA, strategic management cannot be chosen as the method for managing the water supply programme in Indonesia.

Portfolio Management

A management approach that is quite similar to the programme management approach is portfolio management. Although it concerns managing projects and other tasks in a coordinated way, but portfolio management focuses more on resource deployment, prioritisation, and the transfer of knowledge and learning (Pellegrinelli, 2008).

By definition, the portfolio is the totality of an organisation's investment (or segment thereof) in the changes required to achieve its strategic objectives (Sowden, 2011: 285). The projects or programmes of the portfolio may not necessarily be interdependent or directly related (Project Management Institute, 2013: 9). Therefore, unlike programme management, portfolio management does not necessarily manage related projects and gives less attention to integrating them.

The Project Management Institute (2013: 10) stated that portfolio management focuses on ensuring that projects and programmes are reviewed to prioritise resource allocation, and that the management of the portfolio is consistent with, and aligned to, organisational strategies. Accordingly, compared to portfolio management, programme management contributes more to prevent fragmentation in decision-making (Gray, 1997). Thus, since the programme approach has better focus on

synergising projects, portfolio management cannot be accepted as the chosen approach and management method for water supply development in Indonesia.

Multi-Project Management

Another similar approach is multi-project management. Under this approach, projects can run in parallel, sequentially, or in combination, as long they remain consistent in attaining the common goals (Wijnen and Kor, 2000; Maylor *et al.*, 2006; and Lycett *et al.*, 2004). However, multi-project management conducts projects simultaneously without any relevant manageable linkage, and is not concerned with goal-oriented management (Wijnen and Kor, 2000).

Since projects are the components of a programme, project and programme management approaches are complementary (Pellegrinelli, 2011). The project approach directs energy, while the programme approach combines energy Kippenberger (2000: 7), and this is the weakness of multi-project management, which does not prioritise the synergising of projects in attaining programme outcomes.

Furthermore, when it is understood and correctly implemented, programme management provides a framework to help project managers look at their positions within the programme framework, and may help address current problems in projects (Ferns, 1991). Therefore, multi-project management is not a suitable approach for water supply development in Indonesia.

6.5.4 SBPA as the Selected Approach

After comparing the alternative management approaches as discussed above, the Spatial-Based Programme Approach offers more convincing arguments for the synergising of related projects. As also emphasised by Wijnen and Kor (2000), some other management tools use the word management in their titles, such as strategic management, facility management, and policy planning and programming, but do not have anything to do with managing.

As a combination of the programme and spatial approaches, SBPA can synergise a group of related projects to gain outcomes that are unlikely to be achieved when the projects are managed individually. Programme management, as the means of the SBPA, provides a framework that integrates and reconciles competing demands for resources, providing a context and controlled framework for the projects of the programme (Sowden, 2011: 7). Also, the spatial approach offers integration and

delivery coordination both 'vertically' (across scales) and 'horizontally' (between policy sectors) (Haughton *et al.*, 2010: 33).

More specifically for the development of regional water supply infrastructure system in Indonesia, the SBPA can significantly improve synergy and reduce delay in completing the system, as these have been the main issues in Metropolitan Bandung. This approach not only deals with the internal dynamics, but also the external factors beyond the programme boundary. The following chapter discusses how this chosen approach should be applied.

This page is intentionally left blank

CHAPTER 7

APPLICATION OF THE SPATIAL- BASED PROGRAMME APPROACH

CHAPTER 7 APPLICATION OF THE SPATIAL-BASED PROGRAMME APPROACH

7.1	Introduction	229
7.2	Expected Benefits from the Application of SBPA.....	229
7.2.1	Goal Orientation	229
7.2.2	Synergy.....	230
7.2.3	Adaptive and Responsive.....	232
7.2.4	Promote Sustainable Development	235
7.3	Critical Points in Applying SBPA	236
7.3.1	Thorough Needs Assessment	236
7.3.2	Integrating Policies	238
7.3.3	Emphasise the Roles of Planning.....	239
	<i>The Roles of Planning</i>	239
	<i>Spatial Planning</i>	241
7.3.4	Implementing Programming	242
7.3.5	Integrating Budget Resources	244
7.3.6	Aligning Projects to Intended Outcomes.....	245
7.3.7	Strengthening Monitoring, Control, and Evaluation.....	247
	<i>Monitoring and Control</i>	247
	<i>Programme Evaluation</i>	249
7.4	Applying the Spatial-Based Programme Approach.....	249
7.4.1	Anticipated Acceptance Process in Applying SBPA.....	250
	<i>Expected Change Processes</i>	250
	<i>Resistance to Change</i>	251
	<i>Securing Effective Change</i>	252
7.4.2	Attaining Spatial-Based Programme Culture	253
7.4.3	Developing a Programme Management System	256
	<i>Developing Team Work</i>	256
	<i>Programme Management System</i>	257
	<i>Challenges and Benefits of the Programme Management System</i>	258
	<i>Establishing a Programme Management Office</i>	259
	<i>Programme Management Office for the Water Supply Programme in Indonesia</i> ..	262
7.5	Conclusion	263

7.1 Introduction

This chapter completes the last research objective, which is to formulate a proposition to address the problems of water supply development in Indonesia. It also follows the abductive methods used for this research, which underline the need to suggest the application of the proposed concept at the end of the research stage.

This chapter starts by discussing the expected benefits from the correct application of the Spatial-Based Programme Approach (SBPA). It also suggests critical points in applying the SBPA as learnt from the regional water supply development in Metropolitan Bandung. In order to make the application process effective, and looking towards a more permanent application of the approach, the following section discusses the anticipated process and how to develop the water system.

7.2 Expected Benefits from the Application of SBPA

There are at least four major benefits from the application of the SBPA in the setting-up of organisational processes and structures, namely goal orientation, synergy, adaptive and responsive, and promote sustainable development. These benefits are likely to achieve by properly apply the SBPA in all the development processes.

7.2.1 Goal Orientation

The most important feature of the programme approach is its goal orientation. As emphasised by Kor and Wijnen (2007: 18), a programme is a unique complex of goal-oriented efforts. A programme is fundamentally emergent, inspired by a vision or outcome, yet sustained and shaped through on-going interaction and negotiation within its community of interest (Pellegrinelli, 2011: 236).

Therefore, and since the programme is long-term, it must be continually managed with the goals in mind, with the ultimate aim of reaching the agreed goals as closely as possible (Wijnen and Kor, 2000). Over time, programmes should concentrate on directing and bundling the energy of those involved and defining the various roles and rules of the game in order to attain their goals (Kor and Wijnen, 2007).

Accordingly, a programme approach is needed to help coordinate related activities or projects, direct energy, strive for these goals, and react to changing circumstances (Wijnen and Kor, 2000). Pellegrinelli *et al.* (2007) also underline the role of programme managers in being more conscious of, and responsive to, external change and possible shifts of goals.

One of the challenges is that programmes often contain several possible conflicting situations and conflicts of interest. In the programme approach, goals are fine-tuned and pursued by programming them, i.e. by mapping, grouping, and carrying out all the possible, necessary, desired, and conceivable efforts (Wijnen and Kor, 2000). Through the programme approach, programme management makes it possible to bring conflicting goals together in one programme.

As prerequisites, goals and objectives must be clearly outlined as part of a strategic decision-making process (Thiry, 2007). They must be worth pursuing, i.e. concrete, unambiguous, feasible, and measurable (Wijnen and Kor, 2000). Therefore, specificity matters, in terms of at least four elements, namely time frame, the target of the change, results to be achieved, and criteria by which results will be documented, monitored, and measured (Netting *et al.*, 2008).

Learning from the regional water supply development in Metropolitan Bandung, orientation to goals alone is not enough. Indeed, the goal is achieved at the end by looking at the completed system, but there was an issue of inefficiency as shown from the lengthy delay from the expected target. Accordingly, the SBPA offers other benefits when it is implemented correctly, as discussed below.

7.2.2 Synergy

As described earlier, the SBPA combines concepts from the discipline of spatial planning and programme management, by incorporating a spatial aspect into the programme approach. Both the spatial concern and programme approach have the same orientation in synergising development, especially the physical development that requires space, such as water infrastructure.

The issue of the lack of synergy has been the primary concern for this research on the South System in Metropolitan Bandung. The delay in completing the whole infrastructure system occurred due to the delay in finishing related projects and the time gap from one project to the other. Accordingly, this research offers the SBPA as an approach to addressing the synergy issue, as a consequence of the complex organisations involved and prolonged processes.

The SBPA can synergise a group of related projects to gain outcomes that are unlikely to be achieved when the projects are managed individually. To achieve synergy, collaboration between related organisations and individuals and the creation of smooth interdependencies between processes are essential. This is because many government policies require effort from two or more agencies in a coordinated fashion (O'Toole and Montjoy, 1984).

To achieve synergy, awareness of the spatial aspect is needed, especially for physical development that requires land space. An analysis from a spatial perspective is needed to promote a more effective and cohesive policy to address specific spatial issues (Koresawa and Konvitz, 2001). Spatial planning, as the instrument for spatial analysis and territorial management, can help to ensure precise coordination, synchronisation, and integration through a single integrative plan (Nadin, 2001), which can complement the advantages of the programme approach.

The more organisations are involved and the more effort needed for coordination across organisations, the more complicated the situation is in comparison to a single agency case (O'Toole and Montjoy, 1984). The challenging situation of the water supply sector comes from the decentralised system applied in Indonesia, in which there has been a shift from purely central government work for the whole system, to the involvement across various government institutions.

In the context of planning towards attaining synergy, Koresawa and Konvitz (2001) suggest that certain issues from the decentralisation system need to be taken into account in the case of Indonesia, such as:

1. Uncoordinated delegation that may create difficulties among sub-national governments;
2. Integration at sub-national levels, which is particularly tricky when intergovernmental mandates come separately from different central departments;
3. Various private agents (citizens, businesses, and associations are supporting various interests and developers) that are progressively involved in the planning processes and debates;
4. The possibility that coordination and planning may be hampered. This can be due to the absence of central guidelines for the production of strategies. A national policy framework is therefore essential, especially one which tries to achieve a more integrated, cross-sectoral approach, as when physical investment (e.g. infrastructure) must be combined with other strategies and sectors.

A complex programme environment where there are multiple stakeholders with differing and often conflicting needs brings a specific challenge. Accordingly, the SBPA offers a synergistic approach and can reduce conflict between organisations and individuals involved, towards achieving the intended common goals.

The primary meaning of the word “synergy” implies that one works on something with more than one participant in a shared activity, concerning multi-element systems to make them “work together” (Latash, 2008). This understanding emphasises that synergy can occur in any process, level or organisation. Latash (2008) suggests three conditions that have to be met for a group of elements to be considered a synergy:

- The organisational units and individuals should all contribute to the assigned task;
- There should be a response from other elements if one element produces more or less than expected. Changes in contributions are needed to keep the task appropriately performing, compared to what was predicted if all elements act as expected;
- There is an ability to change functions in a task-specific way or to form a different synergy for a different purpose despite remaining in the same set of organisational units or individual.

In complex projects where tasks and objectives are diverse and changing, Eriksson *et al.* (2017) believe that it is important for key stakeholders to collaborate and facilitate quick decision-making and coordination of development efforts. This will generate effective solutions to meet emerging demands and changing circumstances. Collaboration, coordination, and quick decision making, towards the synergised organisation, are the most significant challenges for the development of water supply infrastructure in Indonesia as learnt from the experience of Metropolitan Bandung.

7.2.3 Adaptive and Responsive

As frequently discussed earlier, there were years of delay in completing the first phase of the South System in Metropolitan Bandung. One of the causes is the absence of a programme management office, which led to a lack of capacity in managing risk and change, especially during the programme implementation. This weakness led to the failure of being adaptive and responsive in dealing with the problems in the field.

SBPA offers a concept for improving adaptability and responsiveness in a programme, as underlined by Sowden (2011), who notes that a programme must be able to cope with frequent change. During its implementation, programme work should actively strive to address shifting strategic priorities and desired outcomes, recognising limitations arising from prior decisions and commitments, and anticipating limitations of future ones (Pellegrinelli, 2011: 237).

Lycett *et al.* (2004) highlight issues related to the adaptive behaviour of organisations, such as an excessive control focus, insufficient flexibility in the context of an evolving business strategy, and ineffective co-operation between projects within the programme. By employing adaptive governance, as the purpose of SBPA, the capacity and capabilities of organisations should be fully utilised to spot changes earlier and take prompt appropriate action (Janssen and van der Voort, 2016).

Janssen and van der Voort (2016) suggest the features of an adaptive governance approach for dealing with complex societal issues with many stakeholders, diverging interests, and uncertainty about the actions to be taken, to improve the adaptive capacity of organisations when dealing with uncertainty, and improve the speed of decision-making. Pellegrinelli *et al.* (2007), Lycett *et al.* (2004), and Pellegrinelli (2002) advocate that an effective programme management approach should be adaptive to the changing context.

Additionally, Hrebiniak (2006) suggests establishing a control system to provide feedback and keep management abreast of external changes. Accordingly, SBPA can anticipate the dynamics of implementation towards a more adaptive process, which is responsive to and compensates for unanticipated events.

Implementing policy may require new resources and capabilities to accomplish new objectives, which the implementation may process to be prolonged over several years, disrupted by changes in governments or the ebb and flow of critical resources (Crosby, 1996). There is tension between the ability to react quickly, ensuring stability and the making of sound, transparent and accountable decisions (Janssen and van der Voort, 2016).

From the programme perspective, adaptability or versatility can be assessed by looking at the flexibility of an organisation. This flexibility is often demonstrated by the speed with which an effort can be curtailed or changed (Kor and Wijnen, 2007: 157). However, Janssen and van der Voort (2016) underline that faster action might not mean better and making an uninformed decision or a decision without stakeholder involvement is full of risk.

Applying SBPA also means developing organisational and individual capacity and capability for being adaptive and responsive to changes and risks. This starts with the planning and preparation works and while a programme is being implemented. Therefore, the risks that can disrupt project execution are mitigated by more efficient and effective programme implementation.

7.2.4 Promote Sustainable Development

There are issues related to the sustainable development of the water supply in Metropolitan Bandung, for example, the conversion of around 1.2 hectares of agriculture land into the built area for the water treatment plant and the use of more plastic water bottles due to the lack of safe potables at home. Responding to such issues, the SBPA encourages thinking beyond the programme.

The most widely used sustainable development definition is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). The OECD (2001) stresses sustainable development as the long-term compatibility of the economic, social, and environmental dimensions of human well-being while acknowledging their possible competition in the short-term.

Two central conclusions stem from this realisation (OECD, 2001:35). First, development must balance different objectives and exploit their synergies, as progress in a specific area may be short-lived if not accompanied by simultaneous advances in others. Second, development must be undertaken with a long-term view of its implications, and of the uncertainties that surround them.

Today, programme management, as the means of SBPA, is universally perceived as a strategy execution method and a means to deliver sustainable change (Thiry, 2015). Rather than projects, programmes are better at addressing the content and context of change characterised by environmental uncertainty and ambiguity, complexity, embeddedness and sheer scale (Pellegrinelli, 2011: 235). Programme management work is intimately bound up with context rather than governed by a standard set of transferable principles and processes (Pellegrinelli *et al.*, 2007).

Spatial management, as a complementing aspect to the programme approach, has the same concern and aim for sustainable development. Although traditionally spatial development plans focus on where to put development projects, now there is more pressure to consider how to produce and sustain place qualities in an integrated way (Healey, 2001). Koresawa and Konvitz (2001) add that spatial planning is increasingly concerned with achieving sustainable development.

Koresawa and Konvitz (2001) argue that as a tool to co-ordinate various sectoral policies in pursuit of common spatial development objectives, spatial planning can incorporate wider spatial consequences in location decision-making as a prerequisite to achieving sustainable development goals. Cameron *et al.* (2004) view policy integration, in-line with the programme and spatial approach, as an essential mechanism for contributing to sustainable development.

7.3 Critical Points in Applying SBPA

Learning from the experience of water supply development in Metropolitan Bandung, this research identifies critical points in applying SBPA in order to achieve its benefits for future programme. These critical points span throughout the organisational processes of physical infrastructure development, from needs assessment to evaluation. In a practical context, the discussion in this section, including the reviewed literature, can be adopted as a recommendation for the further development of the water supply in Indonesia.

7.3.1 Thorough Needs Assessment

There should be less issue with assessing the need for a safe water supply since it is quite apparent. However, since there are alternatives to obtaining drinking water, such as bottled water, the need for pipeline-based potable water in Bandung City is not apparent. Moreover, there is less pressure from local people for more connections and more reliable quantity and quality of the current distributed water from their local water company. Therefore, a thorough needs assessment through accurate data collection is required. Kettner *et al.* (2008) underline that having reliable data is a prerequisite to more effective programme planning. Needs assessments can be defined as attempts at estimating deficiencies that can be seen as an unmet need, gaps in services, or problems that have not been previously recognised (Royse *et al.*, 2010).

Bradshaw (1972) conceptualises the so-called 'Taxonomy of Needs', which looks at needs from four different perspectives:

1. Normative need: needs defined by experts in the field;
2. Felt need: as seen by those experiencing the need;
3. Expressed need: the need expressed by those who seek out services;
4. Relative need: the needs and resources in one geographic area compared with needs and resources in another.

Bradshaw (1972) discovers twelve levels of data from the least controversial, when it can be justified from all four perspectives, to the level of unconvincing data because all definitions disregard it as a need (see Table 7.1). The taxonomy of needs helps to build clarity and list data based on credibility or level of trust.

Table 7.1 Taxonomy of Needs

No.	Types of Need (✓ presence and – absence)				Description
	Normative Need	Felt Need	Expressed Need	Comparative Need	
1.	✓	✓	✓	✓	All definitions overlap; the least controversial part of the need
2.	✓	✓	✓	-	Need is postulated felt and demanded but not supplied
3.	✓	✓	-	✓	In need of all other definitions but not wanted or unable to express the need
4.	-	✓	✓	✓	Not postulated by the pundits but felt, demanded, and supplied
5.	✓	✓	-	-	Accepted as such by the expert and felt by the individual, but no demand and supply
6.	✓	-	-	✓	Postulated by the experts and similar persons, but the need is neither felt nor demanded
7.	-	✓	✓	-	Not appreciated by the experts and is not supplied, but which is felt and demanded
8.	-	✓	-	✓	Not postulated by the experts but is felt; not expressed, but is supplied
9.	✓	-	-	-	Postulated by the pundits or professionals
10.	-	✓	-	-	Felt needs but not within the ambit of the social services to meet
11.	-	-	-	✓	Service is supplied despite the absence of need assessed by the other definitions
12.	-	-	-	-	Unidentified need by all definitions

Source: adapted from Bradshaw (1972)

Netting *et al.* (2008) underline that the success of problem-solving rests on clearly defining a need, and developing a deep understanding of the problem that the programme is trying to address. Without thorough needs assessment, it is likely that important positive and negative influences will be overlooked, which might result in wasted effort or off-target results.

Also, spatial analysis of the scale and geographical distribution of needs must be identified for physical development. The spatial analysis helps planners to assess the status of a community, establish general priorities, measure programme impact, and document change over time (Kettner *et al.*, 2008). For the case of the development of water supply infrastructure, it is necessary to understand the geographical distribution of needs, to determine the decision to put the whole infrastructure system in place.

7.3.2 Integrating Policies

Once the needs assessment has been appropriately conducted, the next stage is to formulate a strategy that may be formalised in the form of policy, towards reducing or eliminating the problem and meeting the needs. The policy is defined as aims or goals, or statements of what ought to happen, as found in the form of official government policy, e.g. legislation or the guidelines (Blakemore and Griggs, 2007). However, it is not delimited in terms of schedule or budget (European Commission, 1997a).

The main issue at the policy level is how to integrate different sectoral policies and those at a different level of government. For example, in the case of water supply in Metropolitan Bandung, there was a conflicting policy between providing additional water supply and improving the productivity of the agricultural sector. This conflicting policy can be seen from the conversion of more than 1.2 hectares of fertile agricultural land for the water treatment plant and its supporting buildings, and more water for domestic use that reduces the amount of water for irrigation.

Because integration between sectors is needed, Pressman and Wildavsky (1973) underline that policies should also be mutually supportive rather than contradictory. Furthermore, Stead and de Jong (in Stead and Meijers, 2009) identify advantages from more integrated sectoral policies as follows:

- Promote synergies (win-win solutions) between sectors;
- Reduce duplication in the policy-making process, both horizontally and vertically;
- Promote consistency between policies in different sectors (horizontal) and at different levels of decision making (vertical);
- Improve the achievement of cross-cutting goals or objectives;
- Give more focus to the achievement of a government's overall goals rather than the achievement of narrower sector-orientated goals;
- Help promote innovation in policy development and implementation;
- Encourage a more significant understanding of the effects of policies on other sectors.

Also, RTPI (2014: 35) emphasise that a much higher spatial awareness and intelligence will improve the decisions that are made, and the consequences for the everyday lives of people and communities. Indeed, there is a need for policy-makers, decision-makers, government, and coordinating organisations to respond collectively to the strategic and spatial challenges.

Furthermore, it is vital to ensure that policies and plans result in practical action on the ground (Stead and Meijers, 2009). In other words, it is essential to underline that integrated policy should not be seen as an end in itself but as a way of achieving the outcomes of a programme without sacrificing or minimising the externalities of other sectoral goals.

Accordingly, Tewdwr-Jones (2004: 565) emphasises that “policies and commitments to action must be written in clear, unambiguous language that provides certainty for planning users; they must be accompanied by data, statistics, maps and plans that will assist planning users to understand both the processes of change and the agreed courses of action”. About this concern, RTPI (2014: 37) suggest utilising ‘spatial policy maps’ that could help to:

- Show how and where various policies might interact in terms of their implications for land use, and so encourage greater integration and congruency between policies;
- Maximise the benefits and reduce the dis-benefits from these various policies, and support the achievement of multiple policy goals simultaneously within places;
- Promote greater spatial awareness amongst policy- and decision makers; and
- Stimulate and inform the public debate around spatial issues, including at the community level.

7.3.3 Emphasise the Roles of Planning

As discussed earlier, the development of a regional water system in Metropolitan Bandung was not fully backed-up by plan documents until 2018. For example, the programme was not included in the National Medium-Term Plan 2010-2014 and West Java Spatial Plan 2009-2029, and even the master plan for the development of the regional water system has not become statutory. These planning issues show the need to emphasise the importance of planning in the government programme.

The Roles of Planning

According to Rydin (2003: 1), planning has three essential characteristics. First, it is a future-oriented activity that seeks to devise strategies that will lead to the desired end states. Second, planning is primarily a public sector activity that describes a process by which the public sector, at central, regional and local levels, seeks to influence the activities of firms and households through guidance, regulation and incentives. Third, one particular type of planning is focused on the physical environment, but in other contexts planning may refer to economic or social planning.

Tewdwr-Jones (2012) sees that planning is not a solution in itself, and it is better thought of as a means, a lens, through which we understand and manage spatial processes and change. The role of planning at this time is to mediate between the various actors required to be brought together to enable decisions or development to occur in a way the visionaries imagine.

These roles of planning are missing in Metropolitan Bandung’s water supply programme. It also happens in a broader context for infrastructure development at the national level. A senior planner at the Ministry of Agrarian Affairs and Spatial Planning said, “We have to admit that sectoral plans are not well prepared. They remain focused on the availability of budget allocation before they make a plan. It also happens at the provincial and local level where the planning board is having difficulties because the sectoral agency does not have a five or twenty-year plan.”

It demonstrates that there is a necessity to encourage correct planning and utilise it as a prerequisite to avoid problems during the implementation of a programme. Planning can influence development in many ways as identified by Davidson (1996), namely as an inspiration, a pool of commitment, guidance, and the means to control development. He illustrates the relationship between plans, type of influence, and means of development, as shown in Figure 7.1 below.

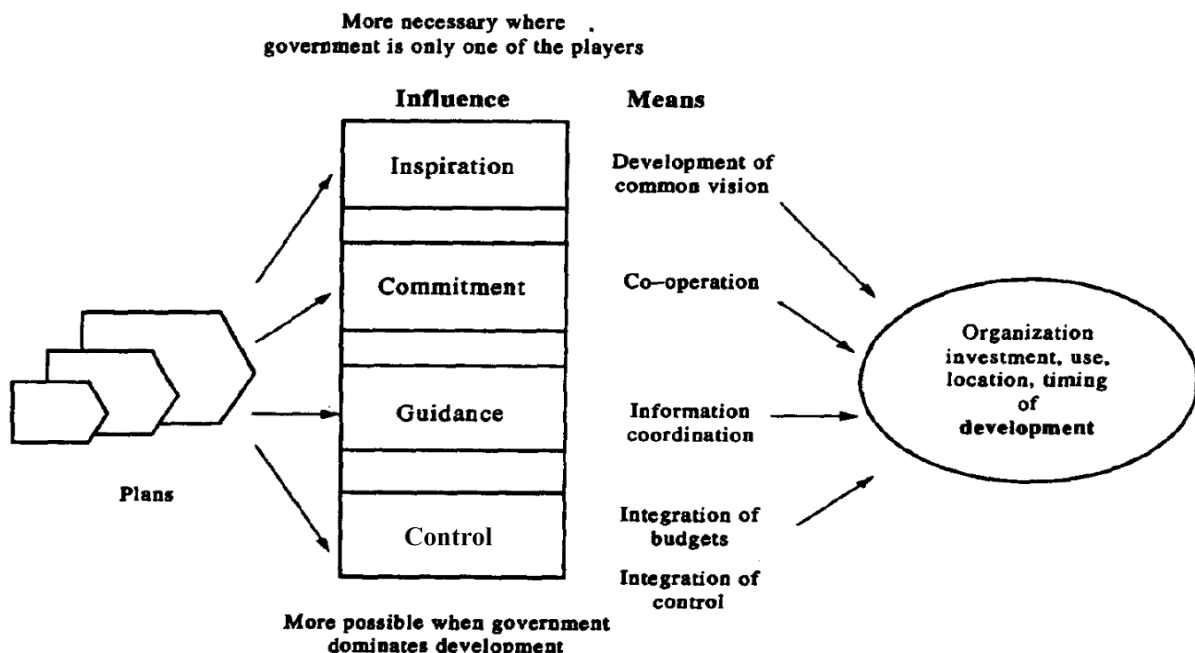


Figure 7.1 Influence of Plans on Development

Source: Davidson (1996: 450)

The influences identified by Davidson (1996: 450-452) can be considered for the context of Indonesia as elaborated below:

1. Inspiration. Plans can be a compelling force as a strong influencer because it makes people want to achieve an outcome. Accordingly, it requires a plan to be very clear, easy to understand, and communicative.
2. Commitment. It is essential if a plan is going to be implemented. Commitment is also fundamental to the development of participative processes.
3. Guidance. It usually involves government, or government planners guiding where and how development takes place. It implies the use of indirect means, such as the provision of a plan showing where development can take place and the location of infrastructure. It is most likely to be successful when the plans have been developed in a manner that engenders extensive support.
4. Control. This influencing ability is a necessary part of any plan which seeks to restrict specific uses of space to certain areas. However, the weakness of control is often in its enforcement, and this depends very much on the systems in place.

The formulated planning documents are not the end of the planning process. It is the spirit of the SBPA where the plans should guide the further implementation processes. In addressing this issue, Carmona and Sieh (2004: 23-24) summarise the purposes of planning, which should be understood and applied for the Indonesian context, as elaborated below:

- Planning is concerned with the relationships between society and space
Planning should also encourage people to think in the spatial context, especially for infrastructure development that needs land and has externalities to other areas;
- Planning is holistic and integrative
The crucial strength of planning is its ability to develop and consider an overview of the whole. Planning helps thinking go beyond a programme and even to think about the relationship between one programme and another;
- Planning attempts to manage processes of change through deliberate and positive actions
Plans guide the remaining preparation processes and their implementation, so that the following processes would not run from the agreed mission, objectives, and goals determined during the planning process;

- Planning requires the appropriate administrative and legal frameworks for implementing action

A plan should not be considered formal until it is statutory. Legalisation is vital to make a plan the official back-up for preparing and implementing a programme;

- Planning involves the allocation of limited resources

While conducting the planning process, resources, such as budget portion and available time length, should be considered together with possible risks and their mitigation in response to a potential change in available resources

- Planning requires the study, understanding, and application of a diverse set of multidisciplinary knowledge

This multidisciplinary knowledge completes the purpose of planning to be able to look beyond a programme. It helps to identify the current issues and potential risks around a programme, as well as in other areas.

Spatial Planning

Planning activities are now concerned with the physical environment but without necessarily focusing on the skills for reshaping or protecting the built and natural environment (Rydin, 2003). Spatial planning integrates policies and programmes for the development and use of land (Kitchen, 2007). In the current situation, spatial planning has a role in place management and policy delivery, as the means of providing infrastructure, and in sub-national integration (Tewdwr-Jones et al., 2010).

The role of the spatial plan has been missing in the development of the water supply in Metropolitan Bandung, since the regional water supply infrastructure is not included in the provincial spatial plan. One of the consequences is the water use conflict between water supply and the farming sector, which could have been addressed during the planning process. Farmers downstream felt threatened by potentially receiving less water after the domestic water system is established. Although the conflict did not disturb the implementation of the programme, this should have been avoided, since an essential principle of spatial planning is to avoid disjointed practices by focusing on the outcome through the programme-based plan (Tewdwr-Jones, 2004).

Moreover, according to Koresawa and Konvitz (2001), spatial planning can support the coordination of sectoral policies, realised by addressing several concerns:

1. Building awareness of spatial interconnections across different issues and areas of policy concern;
2. Having a shared vision and clear policy objectives are prerequisites for the success of any spatial planning exercise;
3. Having clear targets and commitment to improve the performance of individual undertakings;
4. Building the capacity of each level of government, to design projects that are both robust and imaginative.

These expectations demand an additional role of the planner, with the policymaker, to become a programmer (Sturup, 2009), in-line with what is offered by the SBPA. It is vital for the planner to have skills to synthesise, to recognise the core issues within multi-faceted problems, and to be able to propose useful, focused courses of action, and responses to these problems (Carmona and Sieh, 2004). Therefore, the RTPI (2007) encourages planners to improve their skills in programme management.

7.3.4 Implementing Programming

As anticipated, the development of the regional water supply in Bandung is complex and should be carried out strategically and in a proper order. Otherwise, the programme will face difficulties when it is implemented without appropriate preparations. This was what happened with the development of the South System where the programme suffered years of delay, which should be mitigated in advance with a robust programme approach. Unfortunately, programming and programme management are not familiar in Indonesia, unlike project management, and so it is essential to understand the concept and importance of programming, as the means to formulating a programme, and correctly apply the SBPA.

Programming is the function that converts plans into a specific action schedule for the organisation, and consists of developing detailed resource requirements and the actions needed to implement plans (DonVito, 1969). The aim of programming is specifying goals and the effort and means required to attain them (Wijnen and Kor, 2000). In the programme approach, goals are fine-tuned and pursued by programming them, i.e. by mapping, grouping, and carrying out all possible, necessary, desired, and conceivable effort (Wijnen and Kor, 2000: 156).

The principal activity in programming is carrying out the specified efforts, those efforts that are logical and vital for pursuing the specified programme goals (Kor and Wijnen, 2007: 153). This has been missing from the development of the regional water supply in Metropolitan Bandung, and there is no evidence that this process has been conducted, as there is only a draft of the master plan containing the drawing of a system without an action schedule.

Programme plan and design is a critical point in the planning and management of programmes (Sowden 2011; Kettner *et al.*, 2008). It is not a master plan that is formulated and then left on the shelf, but an essential document for controlling the programme, which forms a complete picture of how the programme is going to work (Sowden, 2011). Therefore, a programme plan needs detailed information about progress to enable decision-making and identify pressure points and other issues that may affect progress.

Developing the programme plan requires an understanding of the level of detail in the programme plan and tools to be used to monitor and maintain the programme plan (Sowden, 2011). The plan includes how the information from the programme plan will be presented to stakeholders, to whom it will be distributed, and when project-level information will be integrated at the programme level.

In a more operational, programme design is needed, to identify and define the elements that go into the delivery of a project (Kettner *et al.*, 2008). The purpose of the programme design is to put together related projects that appear to have the best chance of achieving the programme's objectives. It is in the programme design where the approaches are solidified, within the context in which it will be implemented.

Also, Williams and Parr (2004) suggest so-called programme architecture; this is the structures and mechanisms, including programme leader and the team, with the environment, skills, tools, and support needed to operate effectively. The outputs of programme architecture, although very tangible, are often subtle and invisible when things are working well.

Programme risks should be part of the programming process. Some key risks might affect programme management systems at different stages of programme preparation and implementation, namely procurement risks, budgetary risks, delivery risks, scope risks, and transition risks (Williams and Parr, 2004). These types of risks are discussed in Section 3.5.4.

In short, learning from the experience of Metropolitan Bandung, it is essential to have a programme plan. The plan contains at least a specific action schedule to determine links between related projects, organisational structure, and a risk mitigation plan, including the tools for controlling the implementation of the programme. As a consequence, when the programme plan is utilised correctly, programme preparation and implementation is conducted more efficiently.

7.3.5 Integrating Budget Resources

Budgeting secures sufficient funds to put a programme into operation (DonVito, 1969). It is the translation of the programme and financial plan to a more detailed and precise annual budget which sets targets for performance, fixes limits for spending, and forecasts income to be received (Rosef, 1970). West (2011) argues that the idea of budgeting is not just as a matter of allocating fixed shares of the pie; rather, it is an analysis of where money could be spent most effectively.

There is encouraging development in the budgeting system in Indonesia as budget allocation has been a strong interest of internal and external auditors to assess their relevance to its planning. A budgeting staff member in the Water Supply Division⁴² said, “There is a strong recommendation from the Board of Finance and Development Surveillance⁴³ that there is no more budget allocation for a project that has never been listed during the planning process.”

Budgets, as the result of budgeting, reflect the actual, more precise amount of funding available for operations, procurement, personnel support, and all the other activities (Martin *et al.*, 2016). Budgets are thus more precise than plans and programmes, especially in the budget year. All programmes and services depend on funding for their continuation, and, for many funding sources, there are no guarantees that the same level of support will continue year after year.

Traditional budgeting had very little to do with programme management. In the first place, programme budgeting offers a comprehensive framework for the calculation and projection of the discrete alternatives for resource allocation (Gilmour, 1967). By aggregating functionally related expenditure and programme components, regardless of administrative separation, the focus of examination is shifted from departmental or agency expenditure to the goals of government action.

⁴² Under the Ministry of Public Works and Housing.

⁴³ As an independent central government external auditor.

One issue is that the resources required to implement a policy, e.g. financial support, may be under the control of those with as much status and authority as the implementers of the policy, and the former may be uninterested or even opposed to its implementation (Crosby, 1996). This scenario needs to be anticipated in advance, which contrasts sharply with the image of an orderly and predictable set of predetermined steps.

For the case of the development of regional water infrastructure in Indonesia, as learnt from the case of Metropolitan Bandung, synchronising budget resources is vital since the organisations involved have discretion over their respective budget allocation. It is likely to be more complicated when involving non-government institutions, such as a local water company. An official from Bandung City Water Company said, “The (city) government owns the money. They give us money. It needs a process and takes time, (including to process) approval from the local House of Representatives.”

Budgeting is a significant part of programme planning. It considers what resources the programme will require, and how they will be acquired, used, shared and managed effectively. The programme budgeting will include the programme financial needs as expressed in budgets, expenditure profiles and accounting procedures (Sowden, 2011). Furthermore, budget expenditure and changes to its needs, along with the programme span, must be monitored over time. Later on, expenditure and costs should be evaluated against benefits as the programme progresses.

7.3.6 Aligning Projects to Intended Outcomes

Projects are policy implementation tools and one means by which policies are put in practice (Shiferaw and Klakegg, 2012). In other words, the objectives of projects should be aligned with the important priorities in society and the needs of users. At a more strategic level, policies should be aligned with public needs and priorities, and the objectives of public projects should be aligned with policies.

In bridging projects and policies, there is an increasing recognition that programme management provides a means to bridge the gap between deliveries of projects towards achieving organisational strategy (Lycett *et al.*, 2004). Learning from the case of Metropolitan Bandung, the absence of a programme management office led to a lack of coordination between projects and loss of control over the programme timeline. It was covered by a strong informal organisational structure in the form of personal relations between the influential people supporting the coordination, but these were insufficient to build synergy and avoid delay.

This critical issue lies in the implementation of projects within a programme. Poor implementation means the inability to implement projects efficiently, where projects are not completed on time, the cost exceeds the project budget, and the quality of the output is below standard (Shiferaw and Klakegg, 2012). Kolbusa (2013) identifies the essential factors which hinder the implementation of projects or slow them down:

1. Time and resources

The implementation of projects could be slower or even impossible when fewer resources (employees, money, and so on) than required are available. In order to tackle this conflict, a programme plan should arrange implementation momentum based on the availability of resources;

2. Activities instead of results

Actions are the means to the intended result. Only a self-imposed structure and discipline provide the opportunity to achieve the agreed goal;

3. Self-interest versus corporate or project goals

This dilemma is the most difficult and, fatally, is the one which is addressed and managed the least systematically, whereby it can only be tackled using a well-thought-out, consistently applied implementation policy;

4. Lack of clarity about the “why”

The goals have not been precisely formulated in terms of content and have correspondingly not been thought through;

5. No real objective

The plan goals are not explicitly defined, and often only given as a general statement to guide orientation. Because of this, figures, data, and facts do not help convince that the organisation/institution is turning plans into action;

6. Confusion and uncertainty caused by premature action

Often implementation is demanded very quickly. Strategies and changes are not thought through in enough detail, resulting in inefficient implementation.

The concerns discussed above should be avoided by applying the SBPA correctly. Being goal-oriented, synergistic, and more adaptive and responsive to changes of circumstance should always be the orientation in executing related projects within their programme.

7.3.7 Strengthening Monitoring, Control, and Evaluation

The organisational processes of physical development discussed in Chapter 3 underline the essentials of monitoring, control, and evaluation. It has a strategic position where these activities are related to all other development processes.⁴⁴ These three processes should give feedback for the improvement of an on-going programme and another programme in the future.

Learning from the experiences of Metropolitan Bandung, there is no evidence that monitoring, control, and evaluation was performed to achieve the programme goals. The review and evaluation were either too broad on the aggregate at the national level or too small at the project level. Moreover, these processes did not touch the substantial point of giving feedback for more efficient and effective performance under the frame of a programme.

For example, the Director at the Directorate General of Human Settlements said, the “Sub-directorate of Performance Evaluation (under his management) focuses on comparing what has been planned in the Strategic Plan (for five years) with actual achievement”. This is in line with the views of an official in the evaluation sub-division at ministerial level, who said that: “The monitoring system focuses on the progress of physical development and financial disbursement.” Accordingly, it is essential to strengthening the role of monitoring, control, and evaluation, as discussed below.

Monitoring and Control

One of the purposes of the monitoring and control process is programme assurance (Sowden, 2011). This is the assessment of specific aspects to generate confidence that the programme is being managed effectively, and that it is on track to realise the expected benefits and achieve the desired outcomes.

Programme monitoring can be defined as a continuous assessment of the extent to which a programme is implemented as designed and serves its intended target group (Kettner *et al.*, 2008). Completing the assessment from the evaluation process, it is also the role of progress control to provide feedback and keep management abreast of external changes (Hrebiniak, 2006). Furthermore, monitoring and control lay the basis for programme evaluation by helping to ensure that a programme is implemented as intended (Shao *et al.*, 2012).

⁴⁴ See Figure 3.12 (page 88).

The critical components of a monitoring system capable of storing, analysing, and reporting status over time should include data collection formats and timeline, data collection centre, organised data sets, and a standardised report (Schalock, 2002). In order to effectively integrate with the monitoring system, programme controls should be established at the earliest opportunity (Sowden, 2011).

At the programme level, the Project Management Institute (2006) suggests 11 types of control at the programme level, as shown in Table 7.2. Also, Thiry (2004) suggests that iterated appraisals of strategic benefits achievement and stakeholder satisfaction should be embedded in the programme control process.

The absence of a programme management office in Metropolitan Bandung has made programme control very loose. As a consequence, changes are not adequately addressed, and this led to cumulative effects in the form of years of delay in completing the water supply infrastructure programme. It is evidence that strengthening, monitoring, and control in the Indonesian context is essential.

Table 7.2 Type of Control at Programme Level

No.	Type	Description
1.	Integrated change control	Coordinating changes across the entire programme, including changes to cost, quality, schedule, and scope
2.	Resource Control	Managing all programme resources, and their associated cost, according to the programme management plan
3.	Monitoring and Control over Programme Work	Collecting, measuring, and consolidating performance information, and assessing measurements and trends to generate improvements
4.	Issue Management and Control	Identifying, tracking, and closing issues to ensure that stakeholder expectations are aligned with programme activities and deliverables
5.	Scope Control	Controlling changes to the programme scope
6.	Schedule Control	Ensuring that the programme will produce its required deliverables and solutions on time
7.	Cost Control	Controlling changes to and producing information from the programme budget
8.	Quality Control	Monitoring specific programme deliverables and results to determine if they fulfil quality requirements
9.	Communications Control	Managing communications to inform the stakeholders about the programme and resolve issues of interest to them
10.	Performance Reporting	Consolidating performance data to provide information about how resources are being used to deliver programme benefits
11.	Risk Monitoring and Control	Tracking identified programme risks, identifying new risks, executing risk response plans, and evaluating their effectiveness

Source: Extracted from Project Management Institute (2006: 56–64)

Programme Evaluation

Programme evaluation may overlap with monitoring since both concerns with ensuring that a programme is implemented as intended. The difference is that monitoring assesses a programme during implementation, whereas programme evaluation can take place either during implementation (formative evaluation) or after the fact (summative evaluation) (Kettner *et al.*, 2008).

The primary purpose of programme evaluation is to provide feedback on results (outcomes) and programme impacts to inform policy makers and planners about the effectiveness of programmes and the correctness of the assumptions that underlie them (Kettner *et al.*, 2008). Adapted from Sowden (2011), Table 7.3 shows points on how programme management principles can be tested to ensure that the programme is being delivered optimally.

Table 7.3 Evaluating Programme Delivery

No.	Points to Evaluate	Description
1.	Alignment with strategy	Checking the validity of the current plan and design, whether having the right projects running and the current governance strategies
2.	The quality of leadership & behaviours	Exhibited by the people in the programme and the effect that they are having, in terms of levels of support and resistance
3.	The level of engagement	Test whether the programme is achieving and to the understanding of what it intends to deliver and realised
4.	Focus on the benefits and threats to them	Checking that all the outcomes information are in place and current and that the projects are precisely aligned with the outcomes
5.	Adding value	Assures that the programme is still justified in its current form
6.	Design and delivery of coherent capability	Tested against the validity of the blueprint, ability of the projects to deliver that capability, and the ability of the organisation to adopt it
7.	Learning from experience	To know how effectively reviews are being done, how important lessons from these and previous changes are utilised

Source: adapted from Sowden (2011)

7.4 Applying the Spatial-Based Programme Approach

Applying the SBPA is not easy, and a long journey should be anticipated, during which the approach is applied at all levels of an organisation, and even to each individual involved. This is discussed in the following sections.

7.4.1 Anticipated Acceptance Process in Applying SBPA

The following discussions in this section are more on conceptual propositions covering the possible change processes that are likely to happen while applying SBPA. The other discussions are on how to manage the changes that occur and how to make them effective towards a more effective management approach.

Expected Change Processes

Change is an inevitable and constant feature (Mullins, 2010: 752). It is an inevitable part of organisational life where the change can be in one particular form or another. This also applies to the water supply programme in Indonesia. Learning from the experience of the programme in Metropolitan Bandung, many and various events occurred spanning ten years from the first initiation until the day of the inauguration of the infrastructure system.

Although most of the change journey is a unique and highly individual journey, Williams and Parr (2004) identified five typical key phases, as can be seen from Figure 7.3. The five phases are identified from the combination of the two axes as indicated by the diagonal line. The vertical axis indicates the degree of support for the programme to be implemented, while the horizontal axis indicates an organisational response to a lack of coordinated change management.

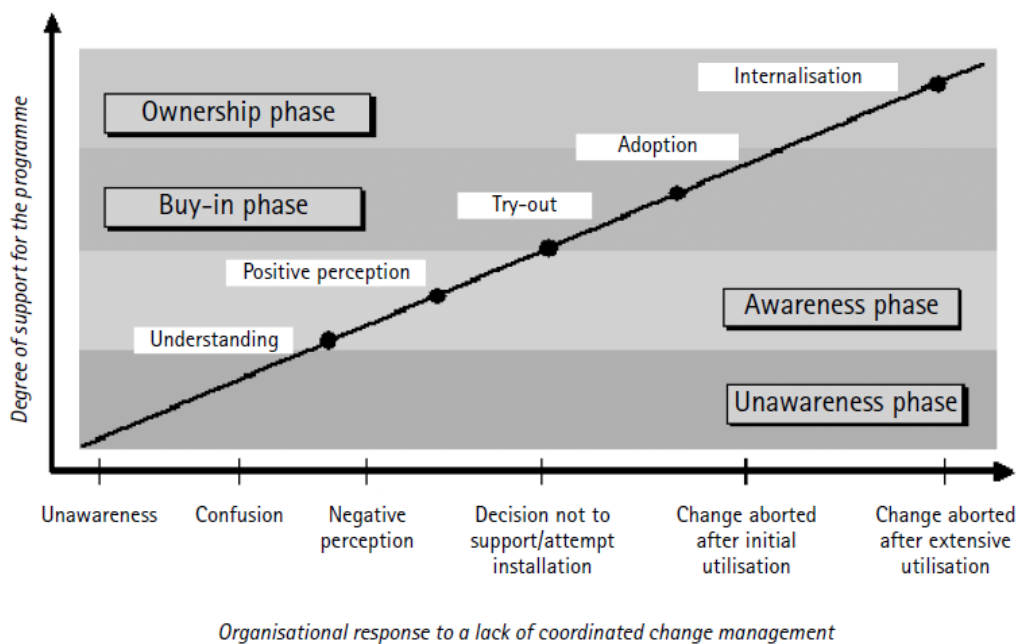


Figure 7.2 Change Acceptance Process

Source: Williams and Parr, 2004: 66

The phases become more positive when the degree of support for a programme is higher and supported by increasing organisational response for coordination. Understanding is the first phase, where the degree of support has just started to rise, and the coordination remains minimal; the final phase is internalisation, where both support for the programme and its coordination for change management is highest. Each of the five phases is summarised in Table 7.4.

Table 7.4 Five Phases of Change Acceptance Process

Phase	Acceptance Level	Description
1	Understanding	Being aware of the upcoming change and its underlying rationale
2	Positive perception	Starting to support (though perhaps not openly) the change
3	Try-out	Willingness to experiment with the new work processes or behaviours, while essentially doing jobs as before
4	Adoption	Following a positive try-out experience and implementing the changes on a day-to-day basis
5	Internalisation	Accepting the changes and turning them into habits and routines and sustaining and improving them in moving forward

Source: adapted Williams and Parr (2004: 65)

Williams and Parr (2004) state that there is a possibility that the effort to make positive change can be aborted anytime if it is not carried out continuously, even when the change has reached the higher phase of adoption and internalisation. Therefore, continuous support for the programme, together with the support for coordinated change management, is essential.

Resistance to Change

During the fieldwork, the concept of SBPA was discussed with the key informants, and there was excitement after discussing the potential benefits from the approach. For example, an Administrator in the Water Supply Directorate welcomed the idea of the preliminary findings on the SBPA in this research. He said, “I understand and agree with the purpose of the programme to control project milestones, to be consistent with a predetermined goal, and so on. I also agree with revising the current business process and organisational network.”

However, since the application of the SBPA will need more effort to synchronise all the organisational processes and possible needs of a new organisational unit, such as a programme management office, there is a potential resistance. Mullins (2010) identifies two types of resistance, namely individual resistance and organisational

resistance. Both types of resistance need to be handled correctly to enable a more effective change process.

Individual resistance to change within organisations can be triggered by numerous reasons, as discussed by Mullins (2010). The main reason is an individual's perception, such as to the possibility of their inconvenience or loss of freedom and the fear of the unknown because of the change. The resistance may also emerge due to the possibility of change in the organisation affecting their well-established habits. Mullins (2010) also identifies examples of organisational resistance due to the following reasons:

- **Organisation culture**
The culture of an organisation may have been developed over time and may not be easy to change;
- **Maintaining stability**
Organisations, especially large-scale ones, pay much attention to maintaining stability and predictability, which may affect their responsiveness to change;
- **Investment in resources**
Change often requires large resources that may already be committed to investments in other areas or strategies;
- **Past contracts or agreements**
Organisations may have contracts or agreements with other parties, organisations, suppliers, and customers. These contracts and agreements can limit changes in behaviour;
- **Threats to power or influence**
Change may be seen as a threat to the power or influence of certain groups within the organisation, such as their control over decisions, resources or information.

Securing Effective Change

Although I did not identify any potential resistance to change among government officials and staff during interviews, the above types of resistance should be anticipated. Mullins (2010) suggests reducing forces against change in work organisations to recognise the needs and expectations of organisation members, including giving sufficient information about the need for, and nature of, the change.

In more detail, Kotter and Cohen in Mullins (2010: 760) list the following eight steps for successful large-scale change:

1. Create a sense of urgency among relevant people, whatever the nature or size of the organisation;
2. Build a guiding team with the credibility, skills, connections, reputations, and formal authority to provide change leadership;
3. Create visions which are sensible, clear and uplifting, as well as sets of strategies;
4. Communicate the vision and strategy to induce understanding and commitment;
5. Empower action and remove obstacles that stop people acting on the vision;
6. Produce short-term wins that help to provide credibility, resources, and momentum to the overall effort;
7. Maintain momentum, consolidate early changes, and create wave after wave of change;
8. Make change stick by nurturing a new culture, and developing group norms of behaviour and shared values.

However, Williams and Parr (2004: 65) argue that there is no 'one-size-fits-all' approach to meeting the needs of a programme. Nevertheless, in order to avoid failure in implementing the SBPA, the following selected conditions suggested by Sowden (2011) should be avoided, such as weak leadership, insufficient focus on benefits, unrealistic expectations of the organisational capacity and ability to change, and insufficient engagement of stakeholders.

7.4.2 Attaining Spatial-Based Programme Culture

As indicated by Williams and Parr (2004), in Figure 7.3, the internalisation of a change is still likely to be aborted even when the change has reached the phase of internalisation. Accordingly, this recommends a stronger and more effective condition for supporting a lengthy application of the SBPA, and finds programme culture to be the more effective situation.

Culture, in the context of the organisation, refers to the shared beliefs, values, and attitudes which form throughout a group's history and which influence how it thinks and acts about all aspects of its functioning (Whelan, 2016: 586). From the given definition of culture, attaining Spatial-Based Programme culture is a more recommended goal than only seeking the internalisation of the approach.

One of the most challenging aspects in the development of a programming culture is for project managers to move from an individual to a team accountability perspective (Thiry, 2016: 47). Developing a programming culture involves a shared understanding of the following objectives (Thiry, 2016: 75):

- Develop a common view and understanding of project and programme management;
- Share programme goals and objectives in order to focus on those goals and objectives;
- Develop programme processes and procedures that are adapted to the programme circumstances and the organisation;
- Develop project processes and documents that are meaningful to the project managers and users to the organisation;
- Define the contribution of each project to the programme and identify the significant elements of contribution.

Merritt and Helmreich (in Thiry, 2007) suggest that to succeed in the implementation of a programming culture, an organisation will require the support of senior management and a clear distinction between project and programme paradigms to establish its foundation. Furthermore, they identify the key factors in conducting a successful culture change, as follows (Thiry, 2007: 137):

1. Role modelling. Significant models, senior management;
2. Mentoring. To explain implicit cultural norms;
3. Language/discourse. Manuals, guidelines, logos, mission statements;
4. Attractive membership. Success stories, belonging to a club, fostering pride, and other incentives;
5. Proactive approach. Show concern and willingness to support a culture;
6. Timing. Use of emergent inputs and successes to reinforce a culture;
7. Training and development. Build culture into training and development; use training and development to reinforce a culture.

Both suggestions from Thiry (2016) and Merritt and Helmreich (in Thiry, 2007) have addressed substantial and technical aspects for attaining the programming culture. To apply SBPA correctly, spatial consideration should be included in all the organisational processes, especially during mentoring and formulating guidelines.

Also, Sowden (2011: 256) highlights the necessity that the senior management of the organisation will need to be seen to build, promote and embed a programme management culture within the organisation. In order to achieve this, he says it will require:

- Board-level sponsorship and visibility as champions. Board members should be fully engaged with sponsoring groups, programme boards and working parties;
- Organisational competence. Programme management knowledge and awareness are needed across the entire organisation, not just in the professional programme community;
- Induction programme. All staff should be made aware of the organisation's commitment to programme management as part of induction, and career paths should be created and promoted via programme offices;
- Education and awareness. To establish the programme within the core of the organisation, all disciplines and functions should be engaged and committed;
- Organisational fit. The level of rigour, therefore, needs to be appropriate to ensure that the organisation can cope with it.

Once the programming culture is embedded, the result is called a "mature programme". The elements of a mature programme, according to Thiry (2016: 73) are:

1. Strategic alignment. All strategies executed through programmes;
2. Stakeholder engagement. Key stakeholders involved in the programme on an on-going basis;
3. Benefit management. Realisation/sustainment of benefits part of the programme scope;
4. Governance. Governance board makes regular decisions in collaboration with the programme manager;
5. Life Cycle. Uses a cyclic programme life cycle from needs analysis to value realisation;
6. Decision management. The programme manager has full authority over the programme, and consults with the Programme Management Board;
7. Leading Change. Transition and integration of change are considered part of programmes;
8. Organisational development. The focus is on a transient competitive advantage and long-term value.

The mature programme is the end condition expected from the SBPA. Hence, the potential benefits of synergy would be achieved. Most importantly, the above-detailed propositions guide the application of the SBPA as it would be translated into correct bureaucratic language towards an effective application of the approach.

7.4.3 Developing a Programme Management System

Experiences from Metropolitan Bandung show that even an informal organisational structure is strong, but it is not enough to attain synergy for a programme as complex as the water supply one in Indonesia. Therefore, it is essential to form a programme management system to make the programme culture more permanent. The following discussions are more on a conceptual basis to arrive at a recommendation on how to perform a programme management system.

Developing Team Work

Haidar (2016) defines a system as an organised, unitary environment composed of two or more interdependent parts, components, or sub-systems and delineated by identifiable boundaries from its milieu. Every system is a sub-system of a yet more extensive system or component systems. Therefore, no system is independent of other systems; there are intensive interactions between different systems.

One of the prerequisites of a programme management office is to work as a team. Lai (1997: 176) emphasises that a team must be able to focus energy, respond rapidly to opportunities, and share responsibilities and rewards. Also, Lain explained that teams are purpose-centred, where its members not only understand the purpose but are committed to it and use the purpose to guide actions and decisions.

Real teamwork occurs in situations where members are performance-dependent on each other, not the summation of works from a group or collection of individuals (Lai, 1997: 176). The difference between the individuals, group, and team can be better understood by looking at Figure 7.4 below.

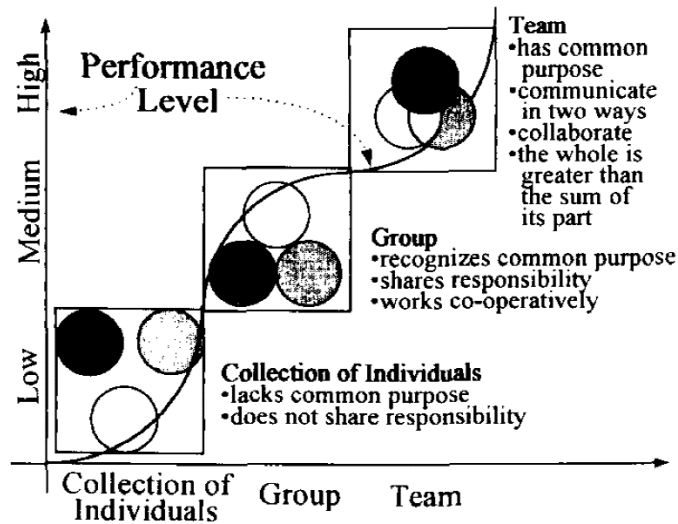


Figure 7.3 Team, Group, and Collection of Individuals

Source: Lai, 1997: 176

Establishing a programme management system is challenging for individuals and teams. The team should be able to manage the full scope of work and monitor the full range of activities to keep complex multi-disciplinary projects strictly on time and budget, and to attain the quality as specified in advance (Barnes *et al.*, 2015). Also, integration and delivery coordination involve both ‘vertical’ (across scales) and ‘horizontal’ (between policy sectors) integration, where all work together towards agreeing and achieving common goals (Haughton *et al.*, 2010).

Programme Management System

Programme management is “the act of carrying out the coordinated organisation, direction, and implementation of a dossier of projects and transformation activities (i.e. the programme) to achieve outcomes....” (Sowden, 2011: 6). Managing a programme ensures all the interfaces within the programme and between the programme and its relevant environment are managed and respected (Kor and Wijnen, 2007).

Specifically, for the construction industry, Barnes *et al.* (2015: 4) define programme management as the management of a related series of projects completed over some time, to accomplish the complete construction of individual inter-related projects on time, within budget, and according to specifications. It provides a framework to help project managers remain aware of their position within the programme framework (Ferns, 1991).

The core of programme management, therefore, includes activities such as integrated planning of multiple projects, identification and understanding of dependencies, managing risks relating to complex interdependencies, maintaining a focus on the overall business benefits of the programme, and coordinating large and often dispersed project teams (Williams and Parr, 2004: 32). As a consequence, programme management demands competent programme managers and teams who not only have knowledge, but are good in practice (Pellegrinelli, 2008).

To appoint a programme manager, experienced project managers are typically recommended. However, Pellegrinelli (2008) found that a project manager may not be a reliable guide on how an individual will perform in a programme management role. Proficiency in applying the frameworks and techniques contained in project management texts and bodies of knowledge alone is not enough to cope with a programme management role. Furthermore, Pellegrinelli (2008) is certain that the skills and approaches employed by practitioners working on bounded projects are required. However, in a programming role, they needed to be more flexible and sophisticated, with increased reliance on intuition, adaptation, and improvisation. New skills and attributes are also required, i.e. a subtle blend of interpersonal skills and personal credibility, a deep understanding of agendas and organisational politics, an ability to build and tap into informal networks, and an appreciation of the broader strategic landscape.

It is the responsibility of the programme manager to establish the system. The indicators of a well-established programme management system are when five essential “functions” of the practical implementation are realised, namely as decision management, governance, stakeholder engagement, change management, and benefits management (Thiry, 2015).

Challenges and Benefits of the Programme Management System

Lycett *et al.* (2004) observe two challenges to apply a programme approach, namely:

1. Significant difficulties of practical application

The review of current approaches to programme management invites three major criticisms which relate to the management of three key stakeholder relationships associated with the programme:

- The management of the relationship between the programme manager and the project managers within the programme

- The management of the relationship between the constituent projects of the programme and the broader business context
- The management of the relationship between the individual project managers within the programme;

2. Fundamentally flawed underlying assumptions

Two flawed assumptions underlie all the issues outlined in the previous section. Firstly, programme management is misconceived as a scaled-up form of project management. Secondly, it is assumed that there is a single form of programme management, equally applicable in all circumstances.

These challenges have been addressed when discussing the critical points in applying the SBPA in Section 7.3. Therefore, the challenges can be adequately managed. As a consequence, benefits from the application of the SBPA and specifically from the programme management system can be achieved.

When the programme management system has been fully established, there are numerous benefits from the system that can be obtained. Williams and Parr (2004: 101) underline benefits from the system that enable the delivery of interrelated projects with common goals, namely:

- Assist in the coordination of resources, timescales, and scope across project teams;
- Facilitate the effective deployment and sharing of skills and knowledge across the programme;
- Track and manage issues, risks, delivery of benefits and alignment to programme objectives;
- Provide executive management with a 'dashboard' on programme progress;
- Provide programme management with the information and levers that they need to manage programmes effectively.

Establishing a Programme Management Office

Sowden (2011) considers that a programme is likely to be managed by a temporary, flexible organisational structure since a programme has a life that spans several years to deliver outcomes and benefits related to an organisation's strategic objectives. This suggestion should fit with the water supply development programme in Indonesia since the programme will need several years to complete but is not so long lasting that it needs a permanent organisational structure to manage it.

Two types of offices deal with the programme identified by Thiry (2015), namely the Programme Management Office (PMO) and Programme Office (PO). In short, the PO deals with only one programme, and the PMO deals with multiple programmes; a PO can be part of the PMO.

The Programme Office has the function of providing central administrative support to programme managers and teams within the programme. The office is mostly used in large programmes with information, data, communication, reporting, monitoring, and control of different projects. The PMO is the structure responsible for defining and managing the programme-related governance, procedures, templates, and so on across various programmes and projects.

In essence, the purpose of the PO is to act as the programme's administrative nerve centre (Bartlett, 2002: 73). The core function of the PO is to provide an information hub for the programme, which will typically involve the following (Sowden, 2011: 265):

- Tracking and reporting – tracking measurements, reporting progress against plans;
- Information management – holding master copies of all programme information, generating all necessary quality and assurance management documentation, maintaining, controlling and updating programme documentation, establishing and maintaining the index to an electronic library of programme information;
- Financial accounting – assisting the programme manager with budget control for the programme; maintaining status reports on all projects in the programme;
- Risk and issue tracking;
- Analysing interfaces and critical dependencies between projects and recommending appropriate actions to the programme manager;
- Maintaining the list of stakeholders and their interests;
- Quality control – establishing consistent practices and standards adhering to the programme governance arrangements, including project planning, reporting, change control, analysing risks and maintaining and updating the risk register for the programme;
- Change control – registering changes for subsequent investigation and resolution, monitoring items identified as requiring action, prompting timely action, and reporting on whether required actions have been carried out.

The programme office may provide additional expertise across the programme, for example (Sowden, 2011: 265):

- Providing a strategic overview of all programmes and interdependencies, and reporting upwards to senior management;
- Providing consultancy-style services to project delivery teams at initiation and throughout the lifecycle of the programme, ensuring that a common approach is adopted and good practice is shared.

There are many different PO models, and no correct model fits all, as the role of the office is always best designed to fit the needs of the specific organisation or programme. Nevertheless, the programme organisation will have to meet needs that include (Sowden, 2011: 47):

- The level of integration and overlap required by project organisations;
- The need to split the responsibilities of the core programme roles across more than one individual to cope with large-scale programmes;
- The requirement for building cross-organisation structures;
- Continual development of competency and individual performance.

Nevertheless, the mutual synergy between programme and projects office has to be maintained. An excellent PO will be very successful when it is supported by a project office that will (Tjahjana *et al.*, 2009: 74-75):

1. Make sure that the project under its control is run according to best practice, as required by the PO. It will improve process execution, deliver improved results, and facilitate the adoption of best practices across the organisation;
2. Ensure that the required reporting information for the project (budget, schedule, and so on) is provided to the PO within the specified timeframe to facilitate the production of management reporting for the executive team. The information collected at ground (Project Office) level from all projects is collated and analysed by the PO. This crucial information is then presented to the executive board to assist them in making strategic decisions for the company;
3. Be supported by the PO in every aspect of project management, including strategic direction and resource requirements. The PO ensures that every Project Office (or project) has what it needs to operate efficiently and effectively;
4. Maintain open lines of communication with the PO (and vice versa). It ensures that any issues can be addressed in a timely fashion.

Programme Management Office for the Water Supply Programme in Indonesia

Taking the lessons from the discussion above, and from the discussion with key informants, the preferred organisation to establish a programme management office for regional water supply development in Metropolitan Bandung is under the West Java Provincial Planning Board. With the similar function of provincial boards across the country, the role can also be applied to other regions in Indonesia.

For Metropolitan Bandung, the provincial planning board has specific experience in managing a similar programme. A planner from the West Java Provincial government said, “The Planning Board has previous experience managing such a programme with the development of West Java International Airport, the movement for sustainable River Citarum [Citarum Lestari], managing the social impact from the development of Jatigede Dam, and other programmes”.

The role of the Planning Board in the above programmes was similar to that expected from a programme management office. Additionally, the planner from the provincial planning board said, “In the past, the similar roles of programme manager in the Planning Board were successfully handled since there was an official strongly concerned with coordinating the related stakeholders to arrive at a so-called Multi-Stakeholders Action Plan for the Implementation of Works [Rencana Aksi Multipihak - Implementasi Pekerjaan/ RAM-IP]. Furthermore, they were conducting the monitoring and controlling the implementation of the action plan.”

The other option suggested by key informants is to establish the office under a water supply agency at the provincial level. This is because the agency knows more detail on sectoral planning up to technical matters. However, this option is less preferable since they also do construction projects. Ideally, a PO should be separated from the PMO, because there is a possibility of being dominant and it is possible to change the timeline as they prefer, before other consent is required.

Thus, a PO under the planning board is preferable because the board can also see beyond a programme, since they have a role in preparing spatial and development plans, and budgeting processes. With experience of coordinating other organisations, the planning board should be able to guide a programme manager while preparing programme plans and implementing them.

7.5 Conclusion

This chapter has outlined the expected benefits of applying the SBPA and the critical points that need to be addressed to achieve its benefits. These benefits were identified from the main concept of the SBPA, as an analytical approach, with the main aim of synergising a group of related projects to gain intended programme outcomes.

Learning from the experience of Metropolitan Bandung and intensive discussions with key informants, the critical points in applying the SBPA were identified. The elaboration under each critical point contains schemes based on conceptual subjects that need to be translated into more operational language in the Indonesian context, for better practical application.

This chapter has also elaborated on ideas of how to develop a programme management system as the ultimate application of the SBPA. This will help minimise the possibility of not applying the approach correctly until it is permanently adopted. The correct application of the SBPA will not only achieve synergy, but also other benefits for a programme in applying this approach, namely being more goal-oriented, adaptive, and responsive to risk and change, and promoting sustainable development.

This page is intentionally left blank

CHAPTER 8
CONCLUDING THOUGHTS AND THE
WAY FORWARD

CHAPTER 8 CONCLUDING THOUGHTS AND THE WAY FORWARD

8.1	Introduction	267
8.2	Lessons Learnt	267
8.2.1	Organisational Process	267
	<i>Work Processes</i>	267
	<i>Behavioural Processes</i>	269
	<i>Change Processes</i>	271
8.2.2	Organisational Structure.....	271
	<i>Formal Configuration</i>	271
	<i>Informal Configuration</i>	272
8.3	Reflection on the Research Question	273
8.3.1	Back to the Research Question and Objectives.....	273
8.3.2	Main Findings.....	274
8.3.3	The Spatial-Based Programme Approach as the Required Measures	275
8.3.4	Applying the Spatial-Based Programme Approach.....	277
8.4	Lessons Learnt for Future Programmes	278
8.5	Empirical Contributions from this Research.....	279
8.5.1	Contributions to Current Knowledge.....	279
	<i>The proposed concept of the Spatial-Based Programme Approach</i>	279
	<i>The amalgamated framework of organisational processes for physical development processes</i>	280
8.5.2	Contributions in the Practical Context.....	280
	<i>Addressing water supply problems in Indonesia</i>	280
	<i>Introducing the discipline of “Programme Management” in Indonesia</i>	281
8.6	Recommendation for Further Research	282
8.7	Personal Reflection: A Closing Remarks.....	282

8.1 Introduction

As the conclusion to the thesis, this chapter unites the core of the discussions from seven previous chapters, to describe the lessons learnt from this research, reach answers to the research question, demonstrate the significance of this research, and recommend areas for further work. The discussion structure follows the research focus on synergy in organisational structure both in the literature and within the case study on water supply development in Metropolitan Bandung.

8.2 Lessons Learnt

As expected, experiences from the development of regional water supply in Metropolitan Bandung have provided many lessons from the aspect of organisational process and organisational structure. This section focuses on the central issue of this research of the lack of synergy that led to a four year delay in completing the whole water supply system in Metropolitan Bandung.

8.2.1 *Organisational Process*

As suggested by Garvin (1998), organisational processes cover organisational work processes, behavioural work processes, and change processes. Accordingly, the discussion in this section follows this structure. Work processes highlight interrelations between processes, behavioural processes show the actions and interactions within organisations, and change processes prove how the organisation responds to changes over time.

Work Processes

Concerning work processes, this research finds that there were two types of delay in completing the water supply system, namely the delay in finishing particular projects and the transition between one project to another. An example of delay in a particular project in Metropolitan Bandung was the construction of the first phase of main distribution pipeline that faced a rejection by the local people since it disrupted the local road traffic. As a consequence, the project had to be withdrawn and required a change in working method so as not to disrupt the traffic.

The more significant delay occurred from the transition between projects. The most significant delays occurred from one phase to another when constructing the main distribution project. There were five phases to install the pipeline networks which wasted 20 months of delay in total.

Integration between projects cannot be achieved without teamwork through cooperation, coordination, and collaboration. For such a complex programme that needs to integrate many aspects, such as institutional, technical, financial, and spatial integration, coordination of the regional water supply development should not merely be based on mutual adjustment, but rather through planning and by design. Otherwise, an organisation will not be able to carry out a programme efficiently.

It is evident from the experience in Metropolitan Bandung that planning and other preparation works were underestimated. The infrastructure development programme was not included in the broader spatial and development planning, among others. As a consequence, potential problems and risks, including possible delays, were not anticipated or mitigated.

One critique is the choice of serial integration of the water supply projects, instead of parallel. Serial integration means that subsequent projects are on hold until previous projects are completed. Technically, however, projects can be carried out in parallel with a thorough design on the interchange of projects. For example, the main distribution can be constructed at the same time as the branch distribution by agreeing on the meeting point between the two types of water pipeline distribution. This is where spatial analysis is required to help integrate one physical infrastructure project with another.

From the sequences, the water supply programme also did not take advantage of designing the projects as a multi-year project. As a consequence, the project offices needed to conduct multiple procurement processes, which take 3–4 months each. Indeed, the bureaucratic process for a multi-year project is longer than a single year project, but overall it will shorten the time significantly.

Other issues are the weak monitoring and evaluation system as the means of development control. Since the two systems are more focused on the quantitative aggregate of projects, a detailed unquantified problem cannot be thoroughly monitored and evaluated. As a consequence, the potential delay was not detected or appreciated as a problem to solve. Therefore, there was no significant response to minimise the delay in the earlier stages.

Besides monitoring and evaluation, this research has also discovered the essentials of 'reviewing' as part of development control. Reviewing tends to provide more active feedback for a more effective and efficient work process in the near future, as the follow up of the monitoring process.

The strengthened roles of auditors in assessing consistency between the planning, programming, and budgeting processes did not touch the problems of delay. The auditors focus was on comparing the list of planning documents and list of projects in budgeting documents. As a consequence, the implementation process is not covered in their investigation. It also applies to the oversight function of the House of Representatives, which did not see a delay in water supply development in Metropolitan Bandung as a significant issue.

There needs to be a significant change in managing a programme as complex as the water supply programme in Indonesia. For Metropolitan Bandung, having back-up from a Presidential Regulation since 2018 should be an advantage to continue implementing the rest of the programme. The regulation should be completed by regulations and guidelines to detail the aspects of the timeline which are not included in the Presidential Regulation.

Another advantage is the mandate in the Ministerial Regulation⁴⁵ which includes regional water supply development in the Provincial Spatial Plan. This would be enough to support the water supply programme if the spatial planning process is conducted correctly, such as through a thorough participatory process to avoid or mitigate resistance in the field in the form of land use and water use conflicts.

In summary, learning from the experience of Metropolitan Bandung, a water supply programme has to follow all organisational processes in the correct sequence using a thorough approach for each process. Indeed, there is always uncertainty within a programme which spans more than one year. Nevertheless, with correct organisational processes, potential problems and risks such as a change in available resources, e.g. budget allocation and time, can be managed appropriately.

Behavioural Processes

Behavioural processes while planning and implementing the water supply programme in Metropolitan Bandung must also be discussed as part of organisational processes. The experience in Metropolitan Bandung shows evidence that accords with the

⁴⁵ Ministry of Agrarian Affairs and Spatial Management.

statement of Mullins (2010), in that behavioural processes are influenced by patterns of organisation structure, technology, styles of leadership, and systems of management. These aspects influence the decision-making process of individuals and organisations, communication styles, and individual and organisational learning processes, as indicated by Garvin (1998).

This research reveals that the pattern of bureaucratic structure has a less significant impact on decision-making processes. The higher government level is not necessarily having a full control to the lower level. This can be seen from the discussions in formulating the bulk water tariff from the regional water system to be paid by local water companies in Bandung City and Bandung Regency. This took a year, much longer than expected. A 'referee' from the Board of Finance and Development Surveillance was appointed to help resolve the dispute.

The lengthy discussion with the involvement of an outsider shows that there was a lack of efficient leadership and management within the water supply programme. By the MoU, the coordination function for water supply in Metropolitan Bandung is in the hands of both the central and provincial governments. However, with no individual to lead the process, the implementation was conducted autonomously by relying on mutual adjustment.

There is an expectation that the current information technology can be utilised to control the development. However, since the current monitoring and evaluation system remain focused on the quantitative progress of projects rather than a programme, the evaluation tends to be inward-looking at the project level, and thus the failures or risks in a programme have been overlooked.

As a consequence, if the programme were to be conducted as it has been in the past, there is no evidence that individuals, groups, and organisations will carry out the programme more efficiently and effectively. The lack of response to minimising the impact of the delay shows that there is also a lack of learning processes within the involved organisations and individuals. In fact, a programme should be a place where learning occurs to make it more efficient and effective through time.

From the above discussion, it is evident that a robust management system should be established to address the issues around behavioural processes, i.e. decision-making, communications, and learning processes, which focus towards more synergised processes for more effective and efficient programme implementation. Otherwise, the water supply programme is likely to remain vulnerable to delay and even cancelled due to the lack of capacity to deal with risks.

Change Processes

Change processes look at how individuals, groups, and organisations adapt, develop, and grow during a sequence of events over time (Garvin, 1998). From ten years of development of regional water supply in Metropolitan Bandung, various lessons can be learnt from the response of the involved organisations and individuals to the demand for change.

One of the main points from the experience of Metropolitan Bandung is that there was no change control. This is an effort to register change for subsequent investigation and resolution, monitoring items identified as requiring action, prompting timely actions and reporting on whether a particular response is required (Sowden, 2011). The key informants for this research explained that there is no such system to control or manage changes.

In the case of delay, there is no evidence that the involved organisations or individuals investigated the cause of the project delay, or how it can affect the achievement of the whole programme. This is an indication of the absence of risk management within the programme, as can be seen from seven months with no construction work, i.e. the construction of water intake, to the construction of the transmission box culvert as the following step. This delay happened again in the following projects.

It is evident that the individuals and organisation did not learn lessons about controlling the delay. In fact, the delay could have been prevented or minimised by setting up the projects as a multiyear project. This should be taken into consideration to avoid lengthy multiple procurement processes. Accordingly, more effective change management should be induced, since, as argued by Mullins (2010), effective change management is a key factor affecting the performance of an organisation.

8.2.2 Organisational Structure

The organisational structure, as stated by Skivington and Daft (1991), includes formal and informal configuration of an organisation. Accordingly, the discussion in this section covers both aspects as they can affect each other.

Formal Configuration

As a driving force, a formal structure should be able to run a programme with high performance to ensure that the intended goals are achieved effectively and efficiently.

However, the experience of Metropolitan Bandung shows that this complex programme was not managed appropriately, at least from the evidence of the four year delay in completing the whole infrastructure system.

There is no evidence that the regional water supply programme in Metropolitan Bandung has a formal structure of related organisations and individuals with their respective responsibilities. The relationship between organisations was based on a Memorandum of Understanding (MoU) and a Cooperation Agreement without any detailed framework of the organisation of the programme to show the hierarchy of authority.

The signatories of the MoU gave a mandate to the central and provincial governments to coordinate the implementation of water supply development in Metropolitan Bandung. However, since there was no further detail concerning the coordinating roles of both government levels, there was no leader to guide regular coordination throughout the planning and implementation phases.

Another apparent flaw is the absence of the PMO, as discussed earlier from a different perspective. It was agreed in the MoU that the coordination should be carried out by the central and provincial governments. However, there was no follow-up to establishing an office or appointing a programme manager, and so many disadvantages arose, such as being unable to deal with potential risks, for example delay.

Without a programme office or manager, each of the involved organisations and individuals bound their relationship informally, but with less guidance. Another impact highlighted from the discussions with the key informants is that each of the institutions tends to be inward looking. They will be satisfied or dissatisfied with what they have done, without relating it to the bigger picture at the programme level.

As discussed by Skivington and Daft (1991), and Mullins (2010), the organisational system cannot be established without a formal organisational structure. This should be purposely planned and created with rules, procedures, and prescriptions, as well as a description of the hierarchy of authority. Otherwise, as can be seen from experience in Metropolitan Bandung, a programme cannot be implemented effectively.

Informal Configuration

Mullins (2010) says that an informal organisation may be used when formal methods fail, because these are lengthy or inapplicable in a particular situation. This situation

occurred in the water supply development in Metropolitan Bandung. As discussed earlier, the programme has no office to manage or an appointed individual to manage all the organisational processes. Hence, related individuals and organisations had to find ways to coordinate through formal and informal meetings or distance coordination by phone, electronic mail, or text messages. With a very minimum guideline to run the programme, this informal configuration of the organisation helped the programme to final completion.

From my observations during the fieldwork and previous professional experiences working for the Ministry of Public Works and Housing, the informal bond is strong. This could be seen in their gestures when the project organisers had a meeting, from the fact that they spoke the same local language (Sundanese), and that most had graduated from the same institute. The point was further noted by at least three key informants in the interviews.

However, although the bond of the informal setting is strong, it was still not enough to avoid a four-year delay in completing the programme, and means that an informal configuration is insufficient to take over the formal structure which would run the programme effectively. Despite their mutual respect, they missed a leader who could control the construction progress and avoid other risks threatening the achievement of the programme goals.

This issue should be reflected on regarding other water supply developments in Indonesia. Although a strong informal organisational structure can be built, it is essential for a programme to prepare a management office and appoint a programme oriented manager, coupled with detailed prescriptions to ensure that a formal organisational structure is established to run a programme effectively.

8.3 Reflection on the Research Question

Based on the lessons learnt from Metropolitan Bandung, this section addresses the research question to generate a proposition to be applied nation-wide. As the analysis chapters discuss what was discovered in this research, this section settles the result and delivers a conclusion.

8.3.1 Back to the Research Question and Objectives

Booth *et al.* (2008: 110) state that “at the core of every research report is the answer to your research question as to the solution to your problem”. Accordingly, this

concluding chapter addresses the question by firstly reconsidering it and utilising the lessons learnt as the basis to formulate the research question. As described in Section 1.4.1, the formulated research question was “**what measures are required to synergise organisational processes and structures for the development of water supply in Indonesia?**”

Three research objectives have been formulated to indicate the stages that should be conducted and content that should be covered to answer the research question. This research has addressed all the objectives and Table 8.2 presents a summary of the relation between research objectives and the respective chapters.

Table 8.1 Attainment of the Research Objectives

No.	Research Objectives	Chapter
1.	To gain insight into organisational processes and structures for physical infrastructure development	3
2.	Identify challenges facing the current water supply development system in Metropolitan Bandung	4 and 5
3.	Formulate a proposition to address the problems of water supply development in Indonesia	6 and 7

The main output of the first objective was to gain insight into how organisational processes for physical infrastructure development can be seen in the amalgamated model showing all the organisational processes from needs assessment to the achievement of programme outcomes. Additionally, the insight into the organisational structure is obtained by discussing how a programme should be arranged, what elements need to be integrated, and so on.

The second research objective was also been attained by identifying challenges from the national system and internal water supply programme. The analysis of challenges was then structured by utilising a SWOT analysis as the basis in formulating appropriate measures to address the lack of synergy.

8.3.2 Main Findings

This research underlines three main findings as to the cause of delays in completing the first regional water supply development in Bandung. The first two emerge from the national system and the last one from the individual aspect.

1. A complex decentralised system

One of the consequences of the Indonesian decentralised system is the segregation of authorities in financing and constructing sub-systems of water

supply infrastructure, as shown on Figure 1.1 (page 4). The segregation of authorities is meant to enhance awareness and improve the capacity of the local governments to develop water supply, as it is their domain by the law to serve their people. However, on the other hand, it demands more organisations and individuals to be involved. This results in making it a more challenging situation to synergise all the development resources, organisations and individuals that are involved.

2. Lengthy organisational processes

The lengthy processes for the development of physical infrastructure, have many detailed elements that need to be followed. These then tend to neglect the planning and other preparations stages, preferring instead to go directly to the execution of the projects. Consequently, potential risks that could have been identified and anticipated earlier are not identified until they become actual, which can then halt the project execution; making delays frequent.

3. Lack of adaptability with the current system

The two challenging complexity issues highlighted above cannot be managed properly when the organisation structure has a lack of responsiveness and adaptability in responding to a dynamic situation. This can be because of the lack of knowledge on how to manage such a complex programme, and/or because of a lack of awareness and ability to do spatial analysis. Additionally, it can also be because of an inappropriate mindset that only thinks at the projects level instead of thinking at a programme level. This lack of awareness and limited learning culture reduces the organisation's capacity to identify potential problems and to anticipate them in the future.

8.3.3 The Spatial-Based Programme Approach as the Required Measures

In response to the characteristics of water supply development in Indonesia, especially in addressing issues of lack of synergy, this research developed a mixed-analytical approach to be applied to all the organisational processes and organisational structure. This approach was generated from the disciplines of spatial planning and programme management, to arrive at the concept entitled a “**Spatial-Based Programme Approach (SBPA)**”, taking advantages from both disciplines.

This analytical approach unites the focus of the spatial dimension in integrating infrastructure components spatially, and the strengths of the programme approach in synergising related projects, and applies in to this research's analysis. Accordingly, this research defines:

The Spatial-Based Programme Approach is an analytical approach to synergise organisational processes and organisational structure, by conducting efficient work towards the effective achievement of a programme outcomes.

The definition above underlines several aspects:

1. An analytical approach

The SBPA requires analysis at the programme level and beyond, by incorporating spatial aspects, to be applied at each stage of the organisational processes, from the needs assessment and planning until the closure of the programme. Consequently, the SBPA must be embedded within individual and organisational mind-sets and working methods.

2. A focus on synergy issues from organisational processes and structures

The SBPA focuses on synergising the integration between one organisational process and another, and one organisation and another. It also achieves synergy by combining the perspectives, knowledge and skills of diverse partners.

3. Effective achievement of programme outcomes

Achievement of programme outcomes should always be in the mind of individuals and as a mission of the related organisation. By being consistently focused on attaining the programme outcomes, a positive attitude towards the programme approach, together with spatial concern, will be established permanently.

4. Efficient work

The SBPA focuses not only on the effective achievement of the programme outcomes but also encourages individuals and organisations to run the organisational processes efficiently. Such efficiency can be achieved by performing synergy in organisational processes supported by the integrated inter-organisational structure.

8.3.4 Applying the Spatial-Based Programme Approach

Overview

Applying the SBPA means incorporating the programme approach and spatial considerations within all organisational processes. It must be embedded within individual and organisational mindsets and working methods. The SBPA should always be in mind when analysing a situation, making a decision, and building communication, and during the learning processes of individuals and as an organisation.

Considering the current challenges to water supply development in Indonesia, this research recommends attending to several critical points to carry out the SBPA correctly. These are: conducting needs assessment thoroughly, integrating related policies, conducting the planning process correctly, formulating applicable programming, integrating budget resources, aligning projects to intended outcomes, and strengthening rigorous monitoring, control, and evaluation system.

The SBPA can also be adopted for the development of other infrastructure sectors in Indonesia. However, the application of the SBPA for another sector should begin with a study of whether the approach will bring additional benefits for the designated programme. As Williams and Parr (2004: 65) state, “there is no ‘one-size-fits-all’ approach to meeting the needs of a programme”.

Feasibility and Likelihood in Applying SBPA

There were two types of approaches considered to address the problem of water supply in Indonesia, i.e. pragmatic approach or comprehensive approach. Considering the urgency and importance for the additional water provision, SBPA offers a pragmatic approach that can be applied and give benefits in relatively shorter time rather than a comprehensive and systemic approach.

More comprehensive approaches were considered in this research e.g. to modify the national decentralised system and cancelling out the segregation of authorities in financing and constructing water supply infrastructure. However, with such large systemic changes to make, the comprehensive approach would take a lot longer time to complete, creating further delays in the completion of infrastructure. Therefore, this research focuses on the SBPA as a more pragmatic approach with greater feasibility that it could be applied more readily within the existing system.

One of the advantages in applying SBPA is that the words “Spatial-based” (Indonesian: berbasis tata ruang) and “Programme” are familiar to be used in Indonesia. The issue is to share a deeper and more substantial understanding of the essence of spatial analysis and programme approach to others to enable them to use them in what they currently do. In addition, it is also essential to translate the academic discussions raised in this thesis into a more operational set of guidelines to be used, especially, by the government organisations.

In order to make the SBPA widely utilised, it is necessary to endorse the central government to formalise the SBPA around the Indonesian government. It can be started from the Ministry of Public Works and Housing as the responsible ministry for water supply government. Regular review and evaluation of the SBPA application need to be made to make sure the sustainability of the implementation and to adapt to the needs from the practical context.

8.4 Lessons Learnt for Future Programmes

Table 8.1 summarises lessons learnt from the experiences of Metropolitan Bandung to be applied for future programmes in Indonesia. Besides for water supply development, this lessons learnt can also be the basis to formulating plans and managing programme implementation for other sectors that have similar complexity, such as road development.

Table 8.2 Summary of the Lessons Learnt for Future Programmes

No.	Theme	Lessons Learnt
Organisational Process		
1.	Work Processes	<ul style="list-style-type: none"> ▪ A programme should go through all organisational processes systematically and thoroughly; ▪ Underestimation of planning and other preparation works will lead to problems during implementation; ▪ It is essential to apply a regular reviewing system, completing monitoring and evaluation processes
2.	Behavioural Processes	<ul style="list-style-type: none"> ▪ Decision-making process, communication style, and learning processes influenced by organisational structure, technology, styles of leadership, and systems of management; ▪ A programme should be the place for a learning process to make the system more efficient and effective over time.
3.	Change Processes	<ul style="list-style-type: none"> ▪ The organisation needs to respond to changes over time; ▪ It is essential to have an organisation that deals with change and risk management.

No.	Theme	Lessons Learnt
Organisational Structure		
1.	Formal Configuration	<ul style="list-style-type: none"> ▪ A programme leader or manager leads to effective programme management; ▪ Programme Management Office (PMO) makes an organisation capable to deal with potential risks and respond to changes.
2.	Informal Configuration	Strong informal relations support a formal configuration of organisational structure to run a programme effectively.

8.5 Empirical Contributions from this Research

This research can be categorised as applied research, since the solution to the problem addressed will have a practical impact (see Booth *et al.*, 2008). Therefore, as seen from its objectives, and in accord with the view of Forester (2015), this research pays equal attention to both the theoretical side and practical life.

8.5.1 Contributions to Current Knowledge

For the contribution to current knowledge, this research has innovative content in the form of useful new concepts and models of how to conceptually and practically link planning to outcomes. These contributions are:

1. The proposed concept of the “Spatial-Based Programme Approach”;
2. The amalgamated framework of organisational processes for physical development processes.

The proposed concept of the Spatial-Based Programme Approach

This new concept can enrich discussions in the field of Planning and Programme Management. There are very limited publications discussing a physical infrastructure development programme that incorporates the programme approach and spatial analysis at the same time. One example is “Construction Programme Management: Decision Making and Optimization Techniques” by Haidar (2016). However, there is very minimal attention to planning, as it states that there is a need for a spatial planning manager under a programme manager but without further elaboration (see Haidar, 2016: 7).

Another example from the few publications within the discipline of Spatial Planning, which also discusses the importance of programme management, is “Shaping and

Delivering Tomorrow's Places: Effective Practice in Spatial Planning" by RTPPI (2007). This publication underlines efficient programme management as one of the key principles of spatial planning. It also encourages planners, especially in the UK, to complement their skill in planning with the knowledge and skills of programme management.

However, there is no publication in the form of a journal paper or an academic book proposing the hybrid of spatial planning and the programme approach at a conceptual level. By combining the advantages of these two disciplines, the SBPA would be a fruitful subject for further interdisciplinary academic discussion.

The amalgamated framework of organisational processes for physical development processes

On a more micro level, the other contribution from this research to the current knowledge is the amalgamated framework on organisational processes for physical development processes. This framework is a fully built up model derived from various basic models to show the organisational processes of physical development from needs assessment to the achievement of the programme outcomes.

Indeed the model is a consolidation of basic models and practices related to the field of physical development, but this can also be utilised or adapted for other fields of study. The model can be broken down to exclude or skip one or more organisational processes.

8.5.2 Contributions in the Practical Context

In addition, it has made a contribution to the introduction of a new discipline in Indonesia and is, thus, an extraordinary opportunity.

1. Addressing water supply problems in Indonesia;
2. Introducing the discipline of "Programme Management" in Indonesia.

Addressing water supply problems in Indonesia

The ultimate contribution of this study is to address the problems of the ±70 million people in Indonesia, who have minimal access to safe, potable water. The outcome from this research can provide valuable contributions in formulating policies, strategies, and guidelines.

The proposed concept of the SBPA can potentially provide a new form of operation in future programmes towards improving the effectiveness, efficiency, and reliability of water supply infrastructure in Indonesia. This was one of my missions in taking PhD studies in Planning. Such a contribution is also very much expected by the Ministry of Public Works, as my sponsor, in the middle of our effort to improve programme delivery of infrastructure development.

One encouraging expectation and feedback came from an administrator in the Water Supply Directorate, who asked me to give advice to improve the workflow of the programme delivery for a regional water supply development, including to improve the effectiveness of the MoU and Cooperation Agreement between involved government and non-government organisations. He suggested starting the work by writing a policy paper to be discussed with his superior.

Additionally, the SBPA offers several potential benefits when a programme correctly applies the approach. These benefits are: having more goal orientation at individual and organisation levels; attaining synergy between organisational processes and organisation structures; being adaptive and responsive to changing circumstances; and, promoting sustainable development for an environmental view. The key points to applying this approach are elaborated in Section 7.2.

As discussed earlier, besides offering SBPA as a pragmatic approach, this research also highlights the possibility to change the national system. This is due to multiple and complex causes of delays contributed by lengthy processes and complex organisation following the established national system. The possibility to modify the national system needs to be researched further, and this would be recommended for future research.

Introducing the discipline of “Programme Management” in Indonesia

Unlike the discipline of project management, which has been widely taught in degree programmes at university and training to government and non-government staff, programme management is unfamiliar among academic communities in universities or other training. At university, project management in Indonesia is taught in management and engineering schools.

Study on programme management in Indonesia is not renowned in any university or non-degree programme. Therefore, this is an opportunity for me to introduce this important subject as derived from this research. The first step is to extract and translate this thesis into a publication in Indonesian, and carry out reviews of academic and government institutions.

8.6 Recommendation for Further Research

The following lists are the recommended topics for future research arise from the broader issues found in the literature and the case analysis, as follows:

- Research on the likelihood to modify the national system
This future research will look at the possibility to modify the national system in a more comprehensive way. One of the goals is to reduce the complexity in developing infrastructure, and other sectors, which also addresses the bureaucratic complexities that cause delays during the preparation and execution of projects.
- Integrate small scale infrastructure into spatial planning
One of the issues for the case of Indonesia is to integrate smaller scale infrastructures, such as water supply, sanitation, and drainage system, into spatial planning. The small size of these infrastructure brought challenges to draw them on spatial planning maps. The other goal from this research is to gain recommendations on how to ensure the inclusion of small-scale infrastructure system to be discussed during the planning processes and on the spatial planning maps.
- Research on organisational structure for infrastructure development
A research on the form of organisational structure for infrastructure development is also interesting. The goal is to formulate an organisational structure that can be more responsive to the needs and adaptive to any dynamic situation. This should include the informal configuration of organisational structure, i.e. the pattern of interactions between organisations involved.
- Research on the choice of construction methods
For the case of Bandung, flaws on the choice of construction methods have made delays during the construction period. This is due to the lack of re-assessment and review of the methods. This recommended future research will see how a construction method is selected and whether the potential risks been considered. A concept of how the construction method should be assessed would be one of the recommendations from this research.

8.7 Personal Reflection: A Closing Remarks

The Indonesian Ministry of Public Works and Housing was concerned about how a programme of infrastructure work, notably related to water provision, could be successfully delivered to the benefit of the end-users. There was also an additional

concern about finding an analytical and organisational approach that would enable them to make the process of the development of infrastructure more efficient. Consequently, the Ministry commissioned me, alongside other individuals on other programmes elsewhere, to complete a PhD research project investigating these issues to arrive at a possible solution.

At a personal level, I also had an on-going interest about the possible usefulness of linking spatial planning and its implementation to the processes of programming and of budgeting to arrive at a possible approach to potentially resolve this particular issue and to improve the delivery of water infrastructure projects and programmes in Indonesia.

My initial interest in spatial planning emerged from my formal education in planning at undergraduate and masters level, and the concern to improve “programming and budgeting” emerged from my professional experiences while working for the ministry. Given my training and practice experience, I could see the potential of a more synergised approach informed by both spatial planning and programme and budgeting thinking as a possible way forward for thinking these issues through; and from this thinking I ultimately developed the SPBA as a possible way forward.

As a practitioner, I knew the general issues and challenges around the development of public works infrastructure; and already had a situated knowledge of the issues that needed to be addressed. Therefore, the main reason for engaging in this PhD research project was to consult with the literature, have discussions with academics from various field, and investigate how an academic approach might help to address the operational and institutional issues creating the delays to the development of infrastructure. Studying the case of water supply development in Bandung have deepened the understanding from an actual case and to take the evidence for supporting arguments in this thesis.

Since I knew what I wanted to achieve from my PhD research, the study was always focused from the outset, even at the point of developing a research proposal, and this has informed the use of an abductive approach to the investigation, the focus of the literature search, the fieldwork design, and the arrangement of thesis structure.

Throughout this research process, I have learned various academic concepts and deepened my understanding of the issues around the development of water supply in Indonesia. This has been a valuable opportunity for me to investigate the core problems in the water supply sector as the basis in formulating propositions to improve

future programmes. As a practitioner in the Ministry of Public Works and Housing, this has complemented my previous professional experiences with the current academic discussions around the area of Spatial Planning and Programme Management.

Booth *et al.* (2008: 10) state that “we do research whenever we gather information to answer a question that solves a problem”. From this perspective, I believe, besides addressing the research question and achieving the objectives, this research has arrived with many lessons learnt regarding how to adequately manage a programme with complex organisational processes and structures.

Lastly, I am confident to endorse the outcomes from this research to enrich the discussions at the academic level and apply the propositions towards a more effective and efficient form of operation for the future development of water infrastructure programmes. As Kor and Wijnen (2007: 4) state, “concepts can only prove their value if they are used in practical situations.”

APPENDIX I

DEFINITION OF KEY TERMS

APPENDIX I DEFINITION OF KEY TERMS

I.1 Planning..... 287

I.2 Project and programme..... 287

I.3 Output, capability, and outcome 288

I.4 Technical terms on water supply 289

DEFINITION OF KEY TERMS

Due to the frequent use of some technical terms that are likely different from the use in daily conversation, this section provides a list of technical terms and its succinct meaning of the terms used in this thesis. Furthermore, these terms will be discussed when it is used throughout the following chapters.

1.1 Planning

This research concerned with Planning conducted by planning bodies at the national, provincial, and municipal level, which can be in the form of Spatial Planning and Development Planning. In this sense, Madanipour (2010: 366) says that one feature of Planning is a formal instrumental process of addressing contingency and complexity by making temporal, spatial, and institutional connections.

Planning as a general activity is the making of an orderly sequence of activities that will lead to the achievement of a stated goal or goals (Hall, 2002: 3). Additionally, Tewdwr-Jones (2012) underlines that Planning is an activity that attempts to manage spatial change. Therefore, planning in this research has its orientation as the pursuit of the common good and about making better places (Campbell, 2012: 391; Healey, 2010). When it is related to the specific programme or projects, the term to be used is “programme planning” or “project planning”.

According to Indonesian laws, there are two types of Planning in the country. Firstly, Spatial Planning that produces spatial-based plans. Secondly, Development Planning is more timely-based planning (twenty years, five years, or annually) and related to the process of budgeting. All levels of government in Indonesia conduct these two types of Planning.

1.2 Project and programme

A project can be defined as a structured process established to deliver specific outputs within the applicable constraints (time, cost, and quality) while taking into consideration elements such as risks and resources (Tjahjana *et al.*, 2009: 4). It is a temporary endeavour undertaken to create a unique product, service, or result (Project Management Institute, 2011: 3), with limited means and a unique complex of activities (Kor and Wijnen, 2007: 192) and a fixed schedule and a dedicated budget (European Commission, 1997a).

Whereas the aim of a project is the realisation of a previously determined deliverable, result or product, a programme pursues multiple (Kor and Wijnen, 2007), Schalock (2002) defines Programme as a set of operations, actions, or activities designed to produce specific desired outcomes. Nevertheless, the most cited definition of the programme and the preferable one for this research was from Ferns (1991). He defines Programme as a group of projects that are managed in a coordinated way to gain benefits that would not be possible where the projects to be managed independently (Ferns, 1991: 149). Therefore, it is the responsibilities of programme management to synchronise such conflicting goals between projects.

A project usually exists for a much shorter duration, which will deliver one or more outputs by an agreed business case, while a programme is likely to have a life spans for several years to deliver outcomes and benefits related to an organisation’s strategic objectives (Sowden, 2011: 286). However, there is common ground between project and programme where both concentrate on directing and bundling the energy of those

involved and defining the various roles and rules of the game as clearly as possible (Kor and Wijnen, 2007).

In order to give a better understanding, Turkulainen *et al.* (2015: 819) illustrate integration in a programme between projects and projects with its organisation as shown in Figure I.1. There are two arrows illustrate showing integration in the form of project-to-project interface and project-to-organisation interface. Nevertheless, there are many other possibilities of interactions between projects, programmes, and organisation.

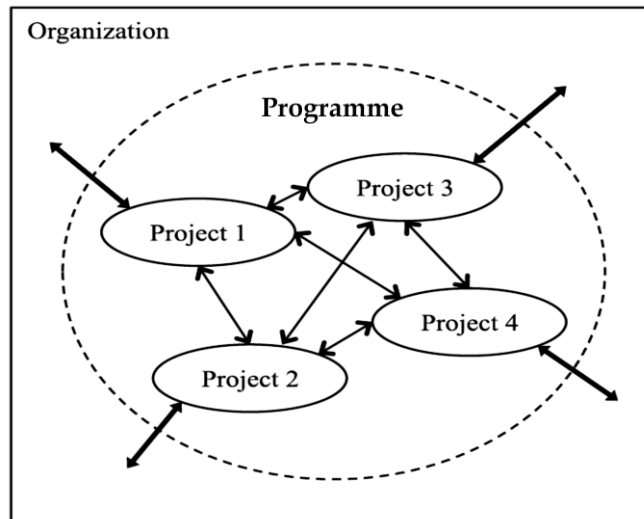


Figure I.1 Integration in a Programme

Source: Turkulainen *et al.* (2015: 819)

The concept of programme and programme approach were born as a means of aligning, coordinating, and managing multiple projects to deliver benefits which would not have been possible when projects are managed independently (Ferns, 1991; Shehu and Akintoye, 2009). Nevertheless, Gray (1997) observes that many programmes emerge as purely nominal umbrella groupings of mainly pre-existing projects which are managed quite independently. For most, programmes are a convenient heading for aggregate reporting or very high-level overview purposes and are more meaningful to the observer than to the participants (Gray, 1997).

1.3 Output, capability, and outcome

The terms Output and Outcomes are frequently used interchangeably though there is a quite clear difference. In short, Output is known as the goods and services produced by an intervention (European Commission, 1997a). Sowden (2011) describes Output as the deliverable developed by a project from a planned activity. For example, a constructed water treatment plant. It is the research's understanding of the term "Output".

"Outcome" can be defined as a new operational state achieved after the transition of the capability into live operations (Sowden, 2011). It is as the longer-term impact, usually expressed in terms of broad socio-economic consequences, which can be attributed to an intervention (European Commission, 1997a). For example, the amount of water produced after the whole infrastructure has been established and functioning. Additionally, Edwards (2001) defines Outcomes as the impact of a policy decision or programme by which the decision on the programme effectiveness can be judged (Edwards, 2001). It is how the term "Outcome" used throughout this thesis.

Sowden (2011) formulates a reasonable description regarding the relations between the outputs and outcomes of a programme or organisation. He introduces the term “capability” that should be achieved before outputs translated to outcomes. Capability, according to Sowden (2011: 79) refers to the completed set of project outputs required to deliver an outcome. It should exist before the transition to a new service, function or operation that enables the organisation to exploit opportunities. For example, the whole water infrastructure system that has been functioning to produce treated water.

1.4 Technical terms on water supply

Mays (2009) and Trifunovic (2016) provide helpful definitions of the technical terms on the water supply sector that frequently used in this thesis as follows.

- Infrastructure: physical capital and the institutions or organisations, both public and privately owned, that provide economic services and have a significant effect, directly or indirectly, on the economic functioning of economic actors (both individuals and firms) but are external to each actor (McCawley, 2015: 264).
- Raw Water or Untreated Water: water which has received no treatment whatsoever, or water entering a plant for further treatment (Mays, 2009: XII).
- Water production: This process takes place at water treatment facilities, with the treated water ends up in a clear water reservoir from where it is supplied to the system (Trifunovic, 2006: 22).
- Water distribution: Pipeline network consists of various pipe dimensions with numerous connections that supply water from the reservoir to the main water meter and go further to the users. In order to achieve optimal operation, different types of reservoirs, pumping stations, water towers, as well as various appurtenances (valves, hydrants, measuring equipment, and the like) can be installed in the system (Trifunovic, 2006: 7).
- Bulk Water: It is the treated water distributed in a significant amount.

The following diagram shows the typical water supply infrastructure system in Indonesia. The actual system might be different depends on the technical considerations in the respective area.

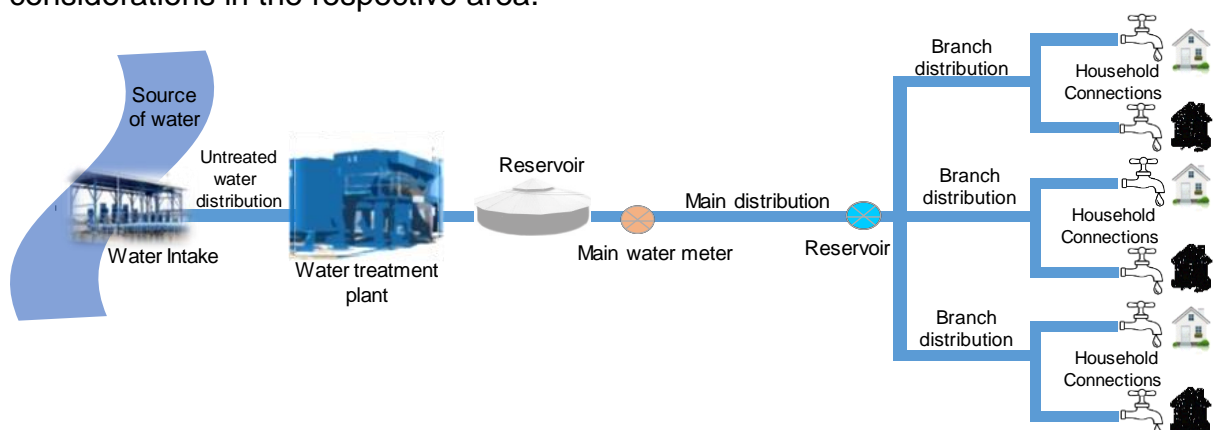


Figure I.2 Typical Water Supply Infrastructure System in Indonesia

Source: adapted from Directorate of Water Supply Development/DWSP (2016: 13)

This page is intentionally left blank

**APPENDIX II
GUIDING QUESTIONS FOR
THE GROUP DISCUSSIONS AND
INTERVIEWS**

APPENDIX II GUIDING QUESTIONS FOR THE GROUP DISCUSSIONS AND INTERVIEWS

II.1 Guiding questions for government staff 293

II.2 Guiding questions for public administration academic 295

II.3 Guiding questions for infrastructure planning academic 295

II.4 Guiding questions for Director for the Integration of Human Settlements
Infrastructure 296

II.5 Guiding questions for an administrator in the Ministry of Agrarian Affairs and Spatial
Management 297

GUIDING QUESTIONS FOR THE GROUP DISCUSSIONS AND INTERVIEWS

The Group Discussions and interviews, during the fieldwork in Bandung and Jakarta, were conducted with guiding questions. These guiding questions were asked to open a discussion in a particular topic and followed by more spontaneous questions subject to the flow of the discussions. However, the flow of the discussions was kept to focus on how the water supply programme in Indonesia was planned and implemented.

There were two occasions where a key informant asked the list of the questions before the interview. These were with the Director for Integration of Human Settlements Infrastructure, under the Ministry of Public Works and Housing and an Administrator in the Ministry of Agrarian Affairs and Spatial Management.

The group discussions and interviews were conducted in the Indonesian language. The following questions are the English translation of the guiding questions. During the interviews, additional questions were needed to confirm and deepen my understanding given while the discussions are progressing.

II.1 Guiding questions for government staff

Overview of development processes

- In which development process have you involved? For how long and in what roles?
- Can you explain your involvement in the regional water supply development in Metropolitan Bandung?
- Do you have any professional relationship with other individual or organisations in the same process and with the following or previous one?

Needs assessment

- How do needs assessment conduct?
- What organisations involved in the needs assessment?
- How the data are validated and finally published and utilised?
- Any input from the users of the data for future improvement in collecting and present the data?
- Is there remain a dispute between data produced by one institution with the other institutions?

Policy analysis

- In what occasion a policy analysis is needed?
- Which organisations conduct policy analysis?
- In what form to make policy is binding to be implemented?

Development planning

- Please explain the development or changes in the national development planning system from 2015?
- Please explain the internal mechanism in formulating development planning?

- Can you explain what data are needed to formulate development planning for water supply development? Is the available data sufficient?
- How detail a programme should be elaborated in the document of the development plan?
- Is there any feedback from monitoring and evaluation processes for the improvement of the future development planning process?

Spatial planning

- Please explain the current planning system and its changes from 2015?
- What should the government do if there is a physical development that needs land space but not accommodated in the current spatial plan?
- How detail a programme should be elaborated in the document of the spatial plan?
- How far have spatial plans been used for the following development process, such as budgeting and plan implementation?
- How far has a “commitment” as the essence of a plan been appreciated?

Programming

- How do the government understand the term “programme”?
- Has programming been regulated in a formal regulation as a process that should be conducted?
- Is there any mechanism or guidelines to adjust development priority from numerous projects proposed? What factors are influencing this process? How about political factor?
- How to ensure the integration between projects in an institution and inter-institution?

Programme management

- During the implementation of a programme/projects, do you have or witness any risks assessment and management?
- Do you think a programme manager or programme management office is essential?
- What do you think about integrating spatial aspect into the programme approach?
- Are there any needs to change management in the government’s programme and projects?
- What do you think of a programme management unit (PMU) as it is required by foreign donor’s programme? Do you think this unit is beneficial for a programme in Indonesia?

Budgeting

- Are there any guidelines to assess consistency between planning and budget allocation?
- How is a budget proposal assessed and discussed?
- What factors are considered when allocating budget? How about political factor?
- Please explain the current information system utilised for budgeting? Including its relation with the current system used in formulating development planning.
- How to ensure the integration of central, provincial, and local government budget for the related projects conducted by different level of government?

Projects execution

- What aspects are considered when formulating project timeline? Any consideration of the other related projects?
- Is persuasion to the affected people as a part of project execution?
- What happens if a built structure is idled for some time?
- Is there any communication forum or a means towards the integration of a project with other projects?

Monitoring and evaluation

- Please explain the current monitoring and evaluation system at the national, provincial, and local level.
- Is there any special monitoring and evaluation system at programme and project level?
- Which organisations are involved in the monitoring and evaluation processes?
- What aspects are monitored and evaluated?
- How far the following development processes have utilised the feedback and recommendation from monitoring and evaluation processes?

Organisational structure

- How is an organisational structure formulated? Top down or bottom up?
- Is there any clarity concerning the responsibilities of each organisation unit?
- How do you see an informal configuration of organisational structure in your institution?
- What makes informal relations durable?
- What organisational structure is needed to plan and implement a programme and projects?

II. 2 Guiding questions for public administration academic

- Can you explain what the processes of physical development are from the perspective of public administration? How can each process influence the other?
- What are the possible problems hindering the achievement of development outcomes?
- Can you elaborate more on the issues around planning process and the related organisations? Especially the one that can potentially hinder the implementation.
- From budgeting, what issues around its process and execution/implementation?
- If you see the implementation, how do the government institutions cooperate?
- From monitoring and evaluation, what makes these processes do not give useful feedback for the following planning and implementation of development programme?
- What factors lead to successful development?
- Can you elaborate planning and implementation processes in the City of Bandung and Metropolitan Bandung?

II. 3 Guiding questions for infrastructure planning academic

- How long have you been involved with planning and implementation processes in central, provincial, and local government?
- Can you explain why domestic water supply did not include in the map of the spatial plan?

- Can you describe issues of water supply service and the plan for Bandung City and the broader region of Metropolitan Bandung?
- How do you see the relationship between water companies and their respective local government as the owner and regulator?
- With the complex problems in water supply development, from what aspect do you think we should start to fix the situation?
- Do you think the regional system will provide significant water supply?
- Can you describe best practices of water supply development in Indonesia and around the world?

II.4 Guiding questions for Director for the Integration of Human Settlements Infrastructure

Issues around the integration of human settlements infrastructure

- How is the integration of the human settlements expected by the Directorate General of Human Settlements?
- What are the key issues around the integration of human settlements infrastructure?

Needs assessment

- Which organisations conducting a needs assessment for Human Settlements sectors? And how do they do it?
- What are the roles of the Directorate of Integration for Human Settlements in conducting or verifying the identified needs from the field?

Policy analysis

- What aspects are considered in formulating development policy for human settlements infrastructure?
- Does the institution conduct a policy analysis before each policy formulation?

Planning

- What plan documents required to gain financial support from the Directorate General of Human Settlements?
- Can you explain the content in the Medium-Term Investment Programme Plan for a local and provincial government?
- How far the Directorate of Integration for Human Settlements involves in a sectoral planning process, such as for domestic water supply?
- How far the Directorate General of Human Settlements involved in the formulation of Spatial Plan for a City/Regency/Province and at the national level?

Programming

- How do you understand the term “programme” here in the Directorate General of Human Settlements?
- Is “programme management” well known and established in this Directorate General? If yes, how far this has been implemented so far? If no, how do you integrate related projects?

Budgeting

- What are the issues around the current budgeting system?
- Are there any particular obstacles in processing a multi-year project?

Monitoring

- Can you explain the current monitoring system required by law and within the internal of the ministry?
- How far risk management implemented in preparing and implementing a programme and projects in this Directorate General?

Evaluation

- What aspects are evaluated from the implementation of a programme and projects?
- How far the outcomes from evaluation become feedback for the next development cycle?

Organisational structure

- Can you explain the related institutions involved in planning and other preparation processes until the implementation of a programme and projects? And how do they cooperate?
- What factors supporting and hindering cooperation?

II.5 Guiding questions for an administrator in the Ministry Of Agrarian Affairs And Spatial Management

Needs assessment and data analysis

- What data and information required for the spatial planning processes?
- What institutions conduct and involved for collecting data as the basis of the needs assessment?
- Is there any verification of the collected data? Especially the one collected by the third party, such as planning consultant.

Planning process

- Can you explain the participatory process, discussion, and iteration in the formulation of spatial planning? Including within line ministries and sectoral agencies in provincial and local government.
- Which parties involved in the spatial planning process? Does it involve spatial plan users, such as budget administrator or evaluator?

Contents of the spatial plan

- How does the assessment of contents and text in the draft of the spatial plan?
- Which individuals and institutions involved in formulating and writing the spatial plan?
- Is there any quality control process in spatial plan formulation?
- Is there any confirmation after the draft of the spatial plan has been formulated?

The utilisation of the spatial plan

- How do you utilise the spatial plan, is it as a document to be strictly implemented or more as a tool to be used for a development that needs a spatial plan?
- Is there any study concerning the utilisation of spatial plan document for programming and budgeting, and also monitoring and evaluation?

Monitoring and evaluation of the spatial plan

- What aspects are monitored and evaluated? How does it evaluate?
- Any involvement of the planner in monitoring and evaluation of the plan?
- What is the response when monitoring and evaluation show the incompatibility with the spatial plan?

Contents of water supply in the spatial plan

- Based on the initial search in the current West Java Provincial Spatial Plan, the development of Regional Water Supply Infrastructure is not included. Any particular reasons behind this?
- When a programme or project is not in the spatial plan, any other planning document that can be used as a reference in integrating infrastructure that requires land space?

This page is intentionally left blank

REFERENCES

- Albrechts, L. (2006) Bridge the Gap: From Spatial Planning to Strategic Projects. *European Planning Studies*, Vol. 14(10): 1487-1500
- Alexander, E.R. (1998) Planning and Implementation: Coordinative Planning in Practice. *International Planning Studies*, Vol. 3(3): 303-320.
- Alexander, E.R. (1985) From Idea to Action, Notes for a Contingency Theory of the Policy Implementation Process. *Administration and Society*, Vol. 16 (4): 403-426
- Alexander, E.R. (1979) Policy-Planning-Implementation: The "Missing Link". In Soen, D. (Ed.). *New Trend in Urban Planning: Studies in Housing, Urban Design and Planning*. Oxford: Pergamon Press.
- Alexander, E.R. and Faludi, A. (1989) Planning and plan implementation: notes on evaluation criteria. *Environment and Planning B: Planning and Design*, Vol. 16: 127-140
- Alfasi, N. and Portugali, J. (2007) Planning Rules for a Self-planned City. *Planning Theory*, Vol. 6(2): 164–182
- Aliseda, A. (2006) Abductive Reasoning Logical Investigations into Discovery and Explanation. AA Dordrecht: Springer
- Alm, J. (2001) Can Indonesia Decentralise Successfully? Plans, Problems and Prospects. *Bulletin of Indonesian Economic Studies*. Vol.1: 1-20
- Anderson, S., Allen, P., Peckham, S., and Goodwin, N. (2008) Asking the right questions: scoping studies in the commissioning of research on the organisation and delivery of health services. *Health Research Policy and System*, Vol.6: 7
- Antono, F.E. (2018) *Kebijakan Pengembangan SPAM* [Policies for the Development of Domestic Water Supply System]. Presentation at the Ministry of Public Works and Housing, delivered on 20 March 2018.
- Archibugi, F. (2008) *Planning Theory from the Political Debate to the Methodological Reconstruction*. Milan: Springer.
- Aritua, B., Smith, N.J., and Bower, D. (2011) What risks are common to or amplified in programmes: Evidence from UK public sector infrastructure schemes. *International Journal of Project Management*, Vol.29: 303–312.
- Arksey, H. and O'Malley, L. (2005) Scoping Studies: Towards A Methodological Framework. *International Journal of Social Research Methodology*, Vol. 8(1): 19-32

- Arto, K., Martinsuo, M., Gemuenden, H.G., and Murtoaro, J. (2009) Foundations of programme management: A bibliometric view. *International Journal of Project Management*, Vol. 27: 1–18
- Axson, David A. J (2010) *Best Practices in Planning and Performance Management: Radically Rethinking Management for a Volatile World* 3rd edition. New Jersey: John Wiley and Sons.
- Baer, W.C. (1997) General Plan Evaluation Criteria: An Approach to Making Better Plans. *Journal of the American Planning Association*, Vol. 63(3): 329-344.
- Baker, M. and Hincks, S. (2009) Infrastructure Delivery and Spatial Planning: The Case of English Local Development Frameworks. *Town Planning Review*, Vol. 80 (2): 173-200
- Balls, H.R. (1970) New Techniques in Government Budgeting 4. Planning, Programming and Budgeting in Canada. *Public Administration*, Vol. 48(3): 289-305.
- Bamberger, M. (2009) Strengthening the evaluation of programme effectiveness through reconstructing baseline data. *Journal of Development Effectiveness*, Vol.1 (1): 37-59
- Bandung City Water Company (2018) Geographic Information System of Bandung City Water Company [unpublished report]
- Bandung City Water Company (2009) *Draft Rencana Induk Pengembangan SPAM Kota Bandung 2009-2029* [Draft Bandung City Master Plan of Water Supply Development 2009-2029] [unpublished report]
- Barnes, M., Sharpe, E., and Walsh, M. (2008) Research Update: Plan Your Work to Work Your Plan. *Parks and Recreation*, Vol. 43 (4): 22-27
- Barnes, P.T., Farren, R., Haidar, A.D., and Wells, K.P. (2015) *Programme Management in Construction*. London: ICE Publishing.
- Bartlett, J. (2002) *Managing Programmes of Business Change*, 3rd edition. Hampshire: Project Manager Today Publications.
- BCG (2015) *Rencana Detail Tata Ruang Kota Bandung 2015-2035* [Bandung City Detailed Spatial Plan 2015-2035]
- BCG (2014) *Rencana Pembangunan Jangka Menengah Kota Bandung 2013-2018* [Medium-Term Development Plan of Bandung City 2013-2018]

- BCG (2011) *Rencana Tata Ruang Kota Bandung 2011-2031* [Bandung City Spatial Plan 2011-2031]
- Berg, B.L. (2001) *Qualitative Research Methods for the Social Sciences*, 4th edition. London: Allyn and Bacon
- Berke, P., Backhurst, M., Day, M., Neil, E., Laurian, L., Crawford, J., Dixon, J. (2006) What Makes Plan Implementation Successful? An Evaluation of Local Plans and Implementation Practices in New Zealand. *Environment and Planning B: Planning and Design*, Vol. 33(4), pp.581-600
- Bertram, R. M., Blase, K. A. and Fixsen, D. L. (2015) Improving Programmes and Outcomes: Implementation Frameworks and Organisation Change. *Research on Social Work Practice*, Vol. 25(4): 477-487
- Bhaskar, R. (1989) *Reclaiming Reality: A Critical Introduction to Contemporary Philosophy*. Brighton: The Harvester Press.
- Blakemore, K. and Griggs, E. (2007) *Social Policy: An Introduction*, 3rd edition. New York: Open University Press.
- Blöndal, J. R., Hawkesworth, I. and Choi, H. (2009) Budgeting in Indonesia. *OECD Journal on Budgeting*, Vol.2: 1-31.
- Bogt, H.T. (2001) Politicians and Output-Oriented Performance Evaluation in Municipalities. *European Accounting Review*, Vol. 10(3): 621-643.
- Booth, A. (2005) The evolving role of the central government in economic planning and policy making in Indonesia. *Bulletin of Indonesian Economical Studies*, Vol. 41(2): 197-219
- Booth, W.C., Colomb, G.G. and Williams, J.M. (2008) *The Craft of Research* 3rd edition. Chicago and London: The University of Chicago Press.
- Bossidy, L. and Charan, R. (2002) *Execution: the discipline of getting things done*. New York: Crown Business
- Botner, S.B. (1970) Four Years of PPBS: an Appraisal. *Public administration review*, Vol. 30(4): 423-431
- Boulay, H. (1981) Local Implementation of Public Policy: Further Notes on the Anatomy of Delay. *State and Local Government Review*, Vol. 13 (1): 26-29
- Bouckaert, G. and Halligan, J. (2008) *Managing Performance: International Comparisons*. London and New York: Routledge.

- BPPSPAM (2019) Buku Kinerja PDAM 2018 Wilayah II [2018 Water Companies' Performance Book for Region II]. [Online] Available from http://sim.ciptakarya.pu.go.id/bppspam/list_category/19 [Accessed 22 March 2019]
- Bradshaw, J.R. (1972) 'The taxonomy of social need', in McLachlan, G. (ed.), *Problems and Progress in Medical Care*. Oxford University Press: Oxford.
- Brundtland, G.H. (1987) *Our Common Future*. New York: Oxford University Press.
- Bryso, J.M. and Bromiley, P. (1993) Critical Factors Affecting the Planning and Implementation of Major Projects. *Strategic Management Journal*, Vol. 14: 319-33.
- Buch-Hansen, H. (2013) Social Network Analysis and Critical Realism. *Journal for the Theory of Social Behaviour*, Vol.44: 306-325
- Buitelaar, E., Galle, M. and Sorel, N. (2011) Plan-Led Planning Systems in Development-Led Practices: An Empirical Analysis into the (Lack of) Institutionalisation of Planning Law. *Environment and Planning A*, Vol.43: 928-941.
- Burgoyne, J. (2008) Critical Realism. In Thorpe, R. and Holt, R. (Eds.). *The Sage Dictionary of Qualitative Management Research*. London: Sage Publications.
- Burnham, J., (1992) Approach, Method, Technique: Making Distinctions and Creating Connections. *Human Systems: The Journal of Systemic Consultation and Management*. Vol. 3: 3-26.
- Busscher, T., Tillema, T. and Arts, J. (2013) Revisiting a programmatic planning approach: managing linkages between transport and land use planning. *Planning Theory and Practice*, Vol. 14(4): 492–508.
- Camagni, R. (2017) Integrated Spatial Planning: Why and How? In Capello, R. (ed.): *Seminal Studies in Regional and Urban Economics: Contributions from an Impressive Mind*. Cham: Springer.
- Cameron, J., Odendaal, N. and Todes, A. (2004) Integrated area development projects: Working towards innovation and sustainability. *Urban Forum*, Vol.15(4): 311–339
- Campbell, H. (2012) Planning to Change the World: Between Knowledge and Action Lies Synthesis. *Journal of Planning Education and Research*, Vol. 32(2): 135–146.

- Campbell, H. (2001) Planners and Politicians: The Pivotal Planning Relationship? *Planning Theory & Practice*, Vol. 2(1): 83-85.
- Campbell, A. and Coulson, A. (2006) Into the mainstream: Local democracy in Central and Eastern Europe. *Local Government Studies*, Vol. 32(5): 543-561.
- Campbell, A. and Goold, M. (1998) *Synergy: Why Links between Business Units Often Fail and How to Make Them Work*. London: Capstone.
- Carmona, M. and Sieh, L. (2004) *Measuring Quality in Planning: Managing the Management Process*. London and New York: Spon Press.
- Carson, D. (2009) The abduction of Sherlock Holmes. *International Journal of Police Science and Management*, Vol. 11(2): 193-202.
- Central Bureau of Statistics (2018) Bandung Municipality in Figures 2018. [Online] Available from: <https://bandungkota.bps.go.id/publication/2018/08/16/a2782ae62042b1aee91fb4bc/kota-bandung-dalam-angka-2018.html> [Accessed 22 March 2019].
- Christensen, K.S. (2015) Both Process and Outcomes are Essential to Planning. *Journal of Planning Education and Research* Vol. 35(2): 188-198.
- Clark, A.M. (2008) Critical Realism. In Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage
- Cline, K.D. (2000) Defining the Implementation Problem: Organisational Management versus Cooperation. *Journal of Public Administration Research and Theory*, Vol. 3: 551-571
- Clune III, W.H. (1983) A Political Model of Implementation and Implications of the Model for Public Policy, Research, and the Changing Roles of Law and Lawyers. *Iowa Law Review*, Vol. 69: 47-125
- Cooke-Davies, T. (2004) Project Success. In Peter W. G. Morris and Jeffrey K. Pinto (Eds.). *The Wiley Guide to Managing Projects*. New Jersey: John Wiley and Sons, Inc.
- Covey, S.R. (2004) *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change*. London: Simon Schuster.
- Cox, J.W. (2008) Triangulation. In Thorpe, R. and Holt, R. (eds.). *The Sage Dictionary of Qualitative Management Research*. London: Sage Publications
- Crang, M. and Thrift, N. (2000) Introduction. In Crang, M. and Thrift, N. (eds.). *Thinking Space*. London and New York: Routledge.

- Crosby, B.L. (1996) Policy Implementation: The Organisational Challenge. *World Development*, Vol. 24(9): 1403-1415.
- Cullingworth, B. (1997) *Planning in the USA: Policies, Issues, and Processes*. London and New York: Routledge.
- Cullingworth, B. and Nadin, V. (2006) *Town and Country Planning in the UK*, 14th edition. London: Routledge
- Dale, R. (2004) *Evaluating Development Programmes and Projects* 2nd edition. London: Sage Publications.
- Dale, K. and Burrell, G. (2008) *The Spaces of Organisation and the Organisation of Space: Power, Identity, and Materiality at Work*. New York: Palgrave MacMillan.
- Damodaran, A. (2005) *The Value of Synergy*. Stern School of Business, New York. [Online] Available from: <https://ssrn.com/abstract=841486> or <http://dx.doi.org/10.2139/ssrn.841486> [Accessed 12 December 2018].
- Danermark, B., Ekström, M., Jakobsen, L., and Karlsson, J. C. (2002) *Explaining Society: An Introduction to Critical Realism in the Social Sciences*. London: Routledge.
- Davidoff, P. and Reiner, T.A. (1973) A Choice Theory of Planning. In Faludi, A. (ed.): *A Reader in Planning Theory*. Oxford: Pergamon Press.
- Davoudi, S., Hart, T. and Vigar, G. (2015) The Nature of Planning. In Cullingworth, B., Nadin, V., Hart, T., Davoudi, S., Pendlebury, J., Vigar, G., Webb, D., and Townshend, T. (eds.): *Town and Country Planning in the UK*, 15th Edition. Oxfordshire: Routledge.
- Davidson, F. (1996) Planning for Performance: Requirements for Sustainable Development. *Habitat International*, Vol. 20(3): 445-462
- Davidson, F. and Lindfield, M. (1996) To Integrate or Not to Integrate: Developing a Model for Effective Integration. In Singh, K., Steinberg, F., and von Einsiedel, N. (eds.) *Integrated Urban Infrastructure in Asia*. New Delhi: Oxford and IBH Publishing.
- De Bruijn, H. (2002) *Managing Performance in the Public Sector*. London and New York: Routledge
- De Vaus, D. (2001) *Research Design in Social Research*. London: Sage Publication.

- Dennison, W. F. (1979) Management Developments in Government Resource Allocation: The Example of the Rise and fall of PPBS (Planning-Programming-Budgeting System). *Journal of Management Studies*, Vol. 16(3): 270-282.
- Directorate of Water Supply (2016) *Program Nasional Mendukung Pencapaian Target Akses Aman Air Minum 100%* [National Programme Supporting the Achievement of 100% Target to Safe Water Access] [Online] Available from <https://slideplayer.info/slide/11817564/> (accessed on 28 May 2019)
- DonVito, P.A. (1969) *The Essentials of a Planning-Programming-Budgeting System*. The Rand Corporation.
- Driver, P. (2016) *Validating Strategies: Linking Projects and Results to Uses and Benefits*. London: Routledge.
- Dyson, R.C. and Foster, M.J. (1983) Making Planning More Effective. *Long Range Planning*, Vol. 16(6): 68-73.
- Easton, G. (2010) Critical realism in case study research. *Industrial Marketing Management*, Vol. 39: 118–128.
- Edwards, M. (2001) *Social Policy, Public Policy: From problem to practice*. Canberra: Allen and Unwin.
- Edwards, R. and Mauthner, M. (2005) Ethics and Feminist Research: Theory and Practice. In Mauthner, M., Birch, M., Jessop, J., and Miller, T. (Eds.). *Ethics in Qualitative Research*. London: Sage.
- Englund, R.L. and Graham, R.J. (1999) From Experience: Linking Project to Strategy. *Journal of Product Innovation Management*, Vol. 16(1): 52-64.
- European Commission (1997a) *Evaluating EU Expenditure Programmes: A Guide Ex post and Intermediate Evaluation*. Luxembourg.
- European Commission (1997b) *The EU Compendium of Spatial Planning Systems and Policies*. Luxembourg.
- Eriksson, P.E, Larsson, J. and Pesämaa, O. (2017) Managing complex projects in the infrastructure sector — a structural equation model for flexibility-focused project management. *International Journal of Project Management*, Vol.35: 1512–1523.
- Faludi, A. (2001) The Performance of Spatial Planning. In Organisation for Economic Co-Operation and Development (OECD) (ed.): *Towards a New Role for Spatial Planning*. Paris: OECD.

- Faludi, A. (2000) The performance of spatial planning. *Planning Practice and Research*, Vol.15: 299–318.
- Faludi, A. (ed.) (1973) *A Reader in Planning Theory*. Oxford: Pergamon Press.
- Faludi, A. and Altes, W.K. (1994) Evaluating Communicative Planning: A Revised Design for Performance Research. *European Planning Studies*, Vol. 2(4): 403-418.
- Farley, M., Wyeth, G., Zainuddin, Istandar, A., and Singh, S. (2008) *The Manager's Non-Revenue Water Handbook: A Guide to Understanding Water Losses*. USAID.
- Ferns, D.C. (1991) Developments in programme management. *International Journal of Project Management*, Vol. 9(3): 148-56.
- Ficery, K., Herd, T., and Pursche, B. (2007) Where has all the synergy gone? The M&A puzzle. *Journal of Business Strategy*, Vol. 28(5): 29-35.
- Fink, A. (2014) *Conducting Research Literature Reviews: from the Internet to Paper*. 4th edition. London: Sage.
- Firman, T. (2014) Inter-local-government partnership for urban management in decentralizing Indonesia: from below or above? Kartamantul (Greater Yogyakarta) and Jabodetabek (Greater Jakarta) compared. *Space and Polity*, Vol. 18(3): 215-232.
- Firman, T. (2009) Decentralisation Reform and Local-Government Proliferation in Indonesia: Towards A Fragmentation of Regional Development. *Review of Urban and Regional Development Studies*, Vol. 21(2/3): 143-157.
- Firmin, M. W. (2008) Data Collection. In Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Fitriani, F., Hofman, B., and Kaiser, K. (2005) Unity in diversity? The creation of new local governments in a decentralising Indonesia. *Bulletin of Indonesian Economic Studies*, Vol. 41(1): 57-79.
- Fixsen, D.L., Blasé, K.A., Naoom, S.F., and Wallace, F. (2009) Core Implementation Components. *Research on Social Work Practice*, Vol. 19 (5): 531-540.
- Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R.M., and Wallace, F. (2005) *Implementation research: A synthesis of the literature*. Tampa, FL: University of South Florida.

- Fletcher, A.J. (2017) Applying Critical Realism in Qualitative Research: Methodology Meets Method. *International Journal of Social Research Methodology*, Vol. 20 (2): 181-194.
- Flyvbjerg, B. (2014) What You Should Know About Megaprojects and Why: An Overview. *Project Management Journal*, Vol. 45 (2): 6-19.
- Flyvbjerg, B. (2006) Five Misunderstandings about Case-Study Research. *Qualitative Inquiry*, Vol.12 (2): 219-245.
- Forester, J. (2015) What Kind of Research Might Help Us Become Better Planners? *Planning Theory & Practice* Vol.16 (2): 145-148.
- Foxell, S. and Cooper, I. (2015) Closing the policy gaps. *Building Research and Information*, Vol.43 (4): 399-406.
- Frank, J.E. (1973) A Framework for Analysis of PPB Success and Causality. *Administrative Science Quarterly*, Vol. 18 (4): 527-543.
- Frankel, E.G. (2015) *Managing Development: Measures of Success and Failure in Development*. London: Palgrave Macmillan.
- Fusaroli, R., Raczaszek-Leonardi, J., and Tylén, K. (2014) Dialog as interpersonal synergy. *New Ideas in Psychology*, Vol.32: 147–157.
- Gaddie, S. (2003) Enterprise programme management: Connecting strategic planning to project delivery. *Journal of Facilities Management*, Vol. 2(2): 177 – 191.
- Garvin, D.A. (1998) The Processes of Organization and Management. *Sloan management review*, Vol. 39(4): 33-50.
- Garzella, S. and Fiorentino, R. (2017) *Synergy Value and Strategic Management: Inside the Black Box of Mergers and Acquisitions*. Naples: Springer.
- Gillham, B. (2000) *Case Study Research Methods*. London: Continuum.
- Gilmour, R.S. (1967) A Planning-Programming Budgeting System. *Proceedings of the Academy of Political Science*, Vol. 28(3): 183-191.
- Gol (2018) *Peraturan Presiden No.45/2018 tentang Rencana Tata Ruang Kawasan Perkotaan Cekungan Bandung* [Presidential Regulation No.45/2018 regarding Spatial Plan of Bandung Basin Urban Area]
- Gol (2015a) *Peraturan Presiden No.7/2015 tentang Kementerian Pekerjaan Umum dan Perumahan Rakyat* [Presidential Regulation No.7/2015 regarding Ministry of Public Works and Housing]

- Gol (2015b) *Peraturan Presiden No.7/2015 tentang Organisasi Kementerian Negara* [Presidential Regulation No.7/2015 regarding Organisation of Line Ministries]
- Gol (2015c) *Peraturan Presiden No.2/2015 tentang Rencana Pembangunan Jangka Menengah Nasional 2015-2019* [Presidential Regulation No.2/2015 regarding National Medium-Term Development Plan 2015-2019]
- Gol (2014) *Undang-undang No.23/2014 tentang Pemerintahan Daerah* [Law No.23/2014 regarding Provincial and Local Government]
- Gol (2011) *Undang-undang No.12/2011 Pembentukan Peraturan Perundang-Undangan* [Law No.12/2011 regarding Establishment of Laws and Regulations]
- Gol (2010) *Peraturan Presiden No.5/2010 tentang Rencana Pembangunan Jangka Menengah Nasional 2010-2014* [Presidential Regulation No.5/2010 regarding National Medium-Term Development Plan 2010–2014]
- Gol (2007) *Undang-undang No.26/2007 tentang Penataan Ruang* [Law No. 26/2007 regarding Spatial Management]
- Gol (2006) *Peraturan Pemerintah No.39/2006 tentang Tata Cara Pengendalian dan Evaluasi Pelaksanaan Rencana Pembangunan* [Government Regulation No.39/2006 regarding Procedures for Control and Evaluation of the Development Plan]
- Gol (2004a) *Undang-undang No.33/2004 tentang Perimbangan Keuangan antara Pemerintah Pusat dan Daerah* [Law No.33/2004 regarding Regional Fiscal Balance]
- Gol (2004b) *Undang-undang No.32/2004 tentang Pemerintahan Daerah* [Law No.32/2004 regarding Regional Government]
- Gol (2004c) *Undang-undang No.25/2004 tentang Sistem Perencanaan Pembangunan Nasional* [Law No.25/2004 regarding the National Development Planning System]
- Gol (2003) *Undang-undang No.17/2003 tentang Keuangan Negara* [Law No.17/2003 regarding State Finance]
- Gol (1999a) *Undang-undang No.25/1999 tentang Perimbangan Keuangan antara Pemerintah Pusat dan Daerah* [Law No.25/1999 regarding Regional Fiscal Balance]

- Gol (1999b) *Undang-undang No.22/1999 tentang Pemerintahan Daerah* [Law No.22/1999 regarding Regional Government]
- Gol (1974) *Undang-undang No.11/1974 tentang Pengairan* [Law No.11/1974 regarding Irrigation].
- Grant, M.J. and Booth, A. (2009) A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information and Library Journal*, Vol.26: 91-108
- Gray, R.J. (1997) Alternative approaches to programme management. *International Journal of Project Management*, Vol.15 (1): 5-9.
- Gray, R.J. and Bamford, P.J. (1999) Issues in programme integration. *International Journal of Project Management*, Vol. 17(6): 361-366.
- Greenhouse, S.M. (1966) The Planning-Programming-Budgeting System: Rationale, Language, and Idea-Relationships. *Public Administration Review*, Vol. 26 (4): 271-277.
- Grindle, M.S. (2007) *Going Local: Decentralisation, Democratization, and the Promise of Good Governance*. Oxford: Princeton University Press.
- Haidar, A. (2016) *Construction Programme Management – Decision Making and Optimization Techniques*. London: Springer.
- Hall, P. (2002) *Urban and Regional Planning*, 4th edition. London: Routledge.
- Hall, B. and Howard, K. (2008) A Synergistic Approach: Conducting Mixed Methods Research With Typological and Systemic Design Considerations. *Journal of Mixed Methods Research*, Vol.2 (3): 248-269.
- Hargadon, A.B., Davis, G. and Weick, K.E. (2003) Reviewed Work(s): Organisations in Action: Social Science Bases of Administrative Theory by James D. Thompson. *Administrative Science Quarterly*, Vol.48 (3): 498-509.
- Harper, E.L., Kramer, F.A., Rouse, A.M. (1969) Implementation and Use of PPB in Sixteen Federal Agencies. *Public Administration Review*, Vol. 29(6): 623-632.
- Harris, P.R. (1984) Team Management Synergy. *Leadership and Organisation Development Journal*, Vol.5 (1): 17-20.
- Harris, P.R. (1981) The Seven Uses of Synergy. *Journal of Business Strategy*, Vol.2 (2): 59-66

- Haughton, G., Allmendinger, P., Counsell, D., and Vigar, G. (2010) *The New Spatial Planning: Territorial management with soft spaces and fuzzy boundaries*. London: Routledge.
- Healey, P. (2010) *Making Better Places: The Planning Project in the Twenty First Century*. Palgrave Macmillan: Hampshire.
- Healey, P. (2006) *Urban Complexity and Spatial Strategies: Towards a Relational Planning for Our Times*. London: RTPI.
- Healey, P. (2003) Collaborative Planning in Perspective. *Planning Theory*, Vol. 2(2): 101-123.
- Healey, P. (2001) New Approaches to the Content and Process of Spatial Development Frameworks. In OECD (ed.) *Towards a New Role for Spatial Planning*. Paris: OECD.
- Healey, P. (1997) *Collaborative Planning: Shaping Places in Fragmented Societies*. London: Macmillan Press.
- Healey, P. and Shaw, T. (1993) Planners, Plans and Sustainable Development. *Regional Studies*, Vol. 27(8): 769-776.
- Heeres, N., Tillema, T., and Arts, J. (2012) Functional-spatial sustainability potentials of integrated infrastructure planning. *Procedia-Social and Behavioral Sciences*, Vol. 48: 2533-2544.
- Hill, M. and Hupe, P. (2002) *Implementing Public Policy: Governance in Theory and in Practice*. London: Sage Publications.
- Hitch, C.J. (1968) The Systems Approach to Decision-Making in the Department of Defense and the University of California. *Operational Research Society*, Vol. 19: 37-45.
- Hoch,C. (2007) Making Plans: Representation and Intention. *Planning Theory*, Vol. 6(1): 16-35.
- Hodgson, G.M. (2006) What are Institutions? *Journal of Economic Issues*, Vol. XL(1): 25.
- Hofler, D.B. (1983) Approach, Method, Technique – A Clarification. *Reading World*, Vol. 23(1): 71-72.
- Hopkins, L. D. (2001) *Urban Development: The Logic of Making Plans*. London: Island Press.

- Hopkins, L. D. (1997): Editorial: Research on Plan-Making. *Environment and Planning B: Planning and Design*, Vol.24: 317-318.
- Hrebiniak, L.G. (2006): Obstacles to Effective Strategy Implementation. *Organisational Dynamics*, Vol. 35(1): 12–31
- Hudalah, D. and Woltjer, J. (2007) Spatial Planning System in Transitional Indonesia. *Journal of International Planning Studies* Vol. 12(3): 291-303.
- Hutapea, E. (2019) Sistem Penyediaan Air Minum Bandung Raya Siap Digunakan [Water Supply System of Metropolitan Bandung is Ready to be Utilised]. *Kompas.com*. 11 January. [Online] Available from <https://properti.kompas.com/read/2019/01/13/102329921/sistem-penyediaan-air-minum-bandung-raya-siap-digunakan>. [Accessed: 30 January 2018].
- Jann, W. and Wegrich, K. (2007) Theories of the Policy Cycle. In Fischer, F., Miller, G.J., and Sidney, M.R. (eds.): *Handbook of Public Policy Analysis Theory, Politics, and Methods*. London: CRC Press.
- Janssen, M. and van der Voort, H. (2016) Adaptive governance: Towards a stable, accountable and responsive government. *Government Information Quarterly*, Vol.33: 1–5.
- Jernberg, J.E. (1969) Information Change and Congressional Behavior: A Caveat for PPB Reformers. *The Journal of Politics*, Vol. 31(3): 722-740.
- Johnson, G., Scholes, K. and Whittington, R. (2008) *Exploring Corporate Strategy*. London: Prentice Hall.
- Josephson, J.R. (1996) Conceptual Analysis of Abduction. In Josephson, J.R. and Josephson, S.G. (Eds.) *Abductive Inference: Computation, Philosophy, Technology*. Cambridge: Cambridge University Press.
- Jupri, J. and Mulyadi, A. (2017) Suburban Zoning of Bandung Raya Area. *Jurnal Pendidikan Geografi*, Vol. 17(2): 105-116.
- Kanter, R. (1994) *Collaborative Advantage: The Art of Alliances*. Harvard Review, July-August: 96-108.
- Kato, S. and Ahern, J. (2008) 'Learning by Doing': Adaptive Planning As a Strategy to Address Uncertainty in Planning. *Journal of Environmental Planning and Management*, Vol. 51(4): 543-559.
- Kettner, P.M., Moroney, R.M., and Martin, L.L. (2008) *Designing and Managing Programs: an Effectiveness-Based Approach*, 3rd edition. London: Sage.

- Kimmel, A.J. (2007) *Ethical Issues in Behavioral Research Basic and Applied Perspectives*, 2nd edition. Oxford: Blackwell Publishing.
- Kingdom, B., Liemberger, R., and Marin, P. (2006) *The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries*. Washington: The World Bank.
- Kippenberger, T. (2000) Using project and programme management to handle 'unique assignments'. *The Antidote*, Vol. 5(4): 6-10.
- Kitchen, T. (2007) *Skills for Planning Practice*. Basingstoke: Palgrave Macmillan.
- Kitchen, T. (1996) A Future for Strategic Planning Policy-a Manchester Perspective, in Tewdwr-Jones, M. (ed.) *British Planning Policy in Transition: Planning in the 1990s*. London: UCL Press.
- Kolbusa, M. (2013) *Implementation Management: High Speed Strategy Implementation*. Berlin: Springer.
- Kong, E. (2008) The Development of Strategic Management in the Non-Profit Context: Intellectual Capital in Social Service Non-Profit Organisations. *International Journal of Management Reviews*, Vol. 10(3): 281–299.
- Kor, R. and Wijnen, G. (2007) *59 Checklists for Project and Programme Managers*. Hampshire: Gower Publishing.
- Koresawa, A. and Konvitz, J. (2001) Towards a New Role for Spatial Planning. in Organisation for Economic Co-Operation and Development (OECD) (ed.): *Towards a New Role for Spatial Planning*. Paris: OECD.
- Kovács, G. and Spens, K.M. (2005) Abductive Reasoning in Logistics Research. *International Journal of Physical Distribution and Logistics Management*, Vol. 35 (2): 132-144.
- Kristensen, J.K., Groszyk, W.S. and Bühler, B. (2002) Outcome-focused management and budgeting. *OECD Journal on Budgeting*, Vol. 1(4): 7–34.
- Lai, L.S.L. (1997) A Synergistic Approach to Project Management in Information Systems Development. *International Journal of Project Management*, Vol. 15(3): 173-179.
- Lank, E. (2006) *Collaborative Advantage: How Organisations Win by Working Together*. Hampshire: Palgrave Macmillan.
- Lasker, R.D., Weiss, E.S., and Miller, R. (2001) Partnership synergy: a practical framework for studying and strengthening the collaborative advantage. *The Milbank Quarterly*, Vol. 79(2): 179-205

- Latash, M.L. (2008) *Synergy*. Oxford: Oxford University Press.
- Laurian, L., Day, M., Backhurst, M., Berke, P., Ericksen, N., Crawford, J., Dixon, J., and Chapman, S. (2004a) Evaluating Plan Implementation: A Conformance-Based Methodology. *Journal of the American Planning Association*, Vol. 70(4): 471-480.
- Laurian, L., Day, M., Backhurst, M., Berke, P., Ericksen, N., Crawford, J., Dixon, J., and Chapman, S. (2004b) What Drives Plan Implementation? Plans, Planning Agencies and Developers, *Journal of Environmental Planning and Management* Vol. 47(4): 555-577.
- Lee, R.D.Jr., Johnson, R.W. and Joyce, P.G. (2013) *Public Budgeting System*, 9th edition. Burlington: Jones and Bartlett Learning.
- Lehtonen, P. and Martinsuo, M. (2008) Change Programme Initiation: Defining and Managing the Program–Organisation Boundary. *International Journal of Project Management*, Vol.26: 21–29.
- Lewis, B.D. (2018) Local Government Form in Indonesia: Tax, Expenditure, and Efficiency Effects. *Studies in Comparative International Development*, Vol. 53(1): 25-46.
- Lewis, B.D. (2017) Does local government proliferation improve public service delivery? Evidence from Indonesia. *Journal of Urban Affairs*, Vol. 39(8): 1047-1065.
- Liedtka, J.M. (1998) Synergy Revisited: How A ‘Screwball Buzzword’ Can Be Good for the Bottom Line. *Business Strategy Review*, Vol. 9(2): 45-55.
- Loh, C.G. (2015). Conceptualizing and Operationalizing Planning Capacity. *State and Local Government Review*, Vol. 47(2): 134-145.
- Loh, C.G. and Norton, R.K. (2013) Planning Consultants and Local Planning. *Journal of the American Planning Association*, Vol. 79(2): 138-147.
- Long, T. and Johnson, M. (2000) Rigour, Reliability and Validity in Qualitative Research. *Clinical Effectiveness in Nursing*, Vol. 4: 30–37
- Lycett, M., Rassau, A. and Danson, J. (2004) Programme Management: A Critical Review. *International Journal of Project Management*, Vol.22: 289–299
- Lynch-Cerullo, K. and Cooney, K. (2011) Moving from Outputs to Outcomes: A Review of the Evolution of Performance Measurement in the Human Service Non-profit Sector. *Administration in Social Work* Vol. 35(4): 364-388

- Madanipour, A. (2010) Connectivity and contingency in planning. *Planning Theory* Vol. 9(4): 351–368
- Maier, H.R. (2013) What Constitutes a Good Literature Review and Why Does Its Quality Matter? *Environmental Modelling & Software*, Vol. 43: 3-4
- March, J. and Simon, H. (1993) *Organisations*, 2nd edition. Oxford: Blackwell
- Martin, B., Tremblay, D., Blickstein, I., Sollinger, J. M., and Yurchak, J. M. (2016) *Navy Planning, Programming, Budgeting, and Execution*. Santa Monica: RAND Corporation.
- Mathews, M. D. (2006) Negative Synergy: A Macro Perspective for Environmental Issues. *International Advances in Economic Research*, Vol.12: 424.
- Matland, R.E. (1995) Synthesizing the Implementation Literature: The Ambiguity-Conflict Model of Policy Implementation. *Journal of Public Administration Research and Theory*, Vol. 5 (2): 145-174.
- Maxwell, J.A. (1998) Designing a qualitative study. In Bickman, L. and Rog, D.J. (Eds.). *Handbook of Applied Social Research Methods*. London: Sage.
- Maxwell, J.A. and Mittapalli, K. (2008a) Explanation. In Given, L.M. (Ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Maxwell, J.A. and Mittapalli, K. (2008b) Explanatory Research. In Given, L.M. (Ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Mayer, I. (2007) The Evolution of Policy Analysis in the Netherlands. In Fischer, F., Miller, G.J., and Sidney, M.R. (eds.): *Handbook of Public Policy Analysis Theory, Politics, and Methods*. London: CRC Press.
- Maylor, H., Brady, T., Cooke-Davies, C., and Hodgson, D. (2006) From Projectification to Programmification. *International Journal of Project Management*, Vol.24: 663-674.
- Mays, L.W. (2009) *Integrated Urban Water Management: Arid and Semi-Arid Regions*. London: CRC Press.
- Mays, L.W. (2002) *Urban Water Supply Handbook*. New York: McGraw-Hill.
- Mays, N., Roberts, E. and Popay, J. (2001) Synthesising research evidence. In N. Fulop, P. Allen, A. Clarke and N. Black (eds.) *Studying the Organisation and Delivery of Health Services: Research Method*. London: Routledge.

- Mazmanian, D.A. and Sabatier, P.A. (1983) *Implementation and Public Policy*. Glenview, Ill.: Scott, Foresman.
- McCawley, P. (2015) Infrastructure Policy in Indonesia 1965–2015: A Survey. *Bulletin of Indonesian Economic Studies* Vol. 51(2): 263-285.
- Meadows, D.L. (1995) It is too late to achieve sustainable development. in: S. Murai (ed.), *Toward Global Planning of Sustainable Use of the Earth: Development of Global Eco-engineering*. Amsterdam: Elsevier.
- Miller, P. (2008) Reliability. In Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Millward, R.E. (1968) PPBS: Problems of Implementation. *Journal of the American Institute of Planners*, Vol. 34(2): 88-94.
- Miterev, M., Engwall, M., and Jerbrant, A. (2016) Exploring programme management competences for various programme types. *International Journal of Project Management*, Vol.34: 545–557.
- Modell, S. and Grönlund, A. (2007) Outcome-Based Performance Management: Experiences from Swedish Central Government. *Public Performance and Management Review* Vol. 31 (2), p.275-288.
- MoAASM (2018) *Peraturan Menteri Agraria dan Tata Ruang No.1/2018 tentang Pedoman Penyusunan RTRW Provinsi, Kabupaten, dan Kota* [Minister of Agrarian Affairs and Spatial Management Regulation No.1/2018 regarding Guidelines in Formulating Provincial, Residential, and City Spatial Plan].
- MoPWH (2016) *Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat No.27/PRT/M/2016 tentang Penyelenggaraan Sistem Penyediaan Air Minum* [Regulation of the Minister of Public Works and Housing No.27/PRT/M/2016 regarding Management of Water Supply Provision System]
- MoPWH (2013) *Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat No. 13/PRT/M/2013 tentang Kebijakan dan Strategi Nasional Pengembangan Sistem Penyediaan Air Minum* [Minister of Public Works and Housing Regulation No. 13/PRT/M/2013 regarding National Policy and Strategy for the Development of Water Supply System]
- MoPWH (2006) *Peraturan Menteri Pekerjaan Umum No.20/PRT/M/2006 tentang Kebijakan dan Strategi Nasional Pengembangan Sistem Penyediaan Air Minum* [Minister of Public Works Regulation No.20/PRT/M/2006 regarding National Policy and Strategy for the Development of Water Supply System]

- Morckley, V.C. (2010): A call for stakeholder participation in evaluating the implementation of plans. *Environment and Planning B: Planning and Design*, Vol. 37: 769-774.
- Morphet, J. (2011) *Effective Practice in Spatial Planning*. London: Routledge.
- Mosher, F.C. (1969) Limitations and Problems of PPBS in the States. *Public Administration Review*, Vol. 29 (2): 160-167.
- Mullins, L.J. (2010) *Management and Organisational Behaviour*, 9th edition. London: Prentice Hall.
- Murray, A. (2009) *Managing Successful Projects*, 5th edition. Norwich: The Office of Government Commerce.
- Nadin, V. (2007) The emergence of the spatial planning approach in England. *Planning, Practice & Research*, Vol. 22(1): 43-62.
- Nadin, V. (2001) Sustainability from a National Spatial Planning Perspective. in Organisation for Economic Co-Operation and Development (OECD) (ed.): *Towards a New Role for Spatial Planning*. Paris: OECD.
- Næss, P. (2015): Critical Realism, Urban Planning and Urban Research. *European Planning Studies*, Vol. 23(6): 1228-1244.
- Næss, P. and Jensen, O. B. (2002): Urban land use, mobility and theory of science: exploring the potential for critical realism in empirical research. *Journal of Environmental Policy and Planning*, Vol. 4(4): 295-311.
- Nag, R., Hambrick, D.C., and Chen, M. (2007) What Is Strategic Management, Really? Inductive Derivation of a Consensus Definition of the Field. *Strategic Management Journal*, Vol. 28(9): 935-955.
- Naoum, S. (2011) *People and Organizational Management in Construction* 2nd edition, London: ICE Publishing.
- National Research Council (2002) *Scientific Research in Education*. Washington, DC: National Academy Press.
- Netting, F.E., O'Connor, M.K., and Fauri, D.P. (2008) *Comparative Approaches to Programme Planning*. New Jersey: Wiley.
- Neuman, M. (1998) Does Planning Need the Plan? *Journal of the American Planning Association*, Vol. 64 (2): 208-220.
- Neuman, M. and Smith, S. (2010) City Planning and Infrastructure: Once and Future Partners. *Journal of Planning History*, Vol. 9(1): 21-42.

- Niiniluoto, I. (1999) Defending Abduction. *Philosophy of Science*, Vol. 66 (supplement): S436-S451.
- Nof, S.Y. (1993) Integration and Collaboration Models. Nof, S.Y. (Ed.). *Information and Collaboration Models of Integration*. Indiana: Kluwer Academic Publishers.
- Novick, D. (1973) *Current Practice in Programme Budgeting (PPBS): Analysis and Case Studies Covering Government and Business*. London: Heinemann.
- OECD (2009) Budgeting in Indonesia. *OECD Journal on Budgeting*, Vol. 2: 1-31.
- OECD (2001) *Sustainable Development: Critical Issues*. Paris: OECD.
- Office of Government Commerce (2005) *Common Causes of Project Failure*. London: Office of Government Commerce.
- Oliveira, V. and Pinho, P. (2011) Bridging the Gap between Planning Evaluation and Programme Evaluation: The contribution of the PPR methodology. *Evaluation* Vol.17 (3): 293-307.
- O'Toole, L.J. (2000): Research on policy implementation: Assessment and prospects. *Journal of Public Administration Research and Theory*, 10(2): 263–288.
- O'Toole, L. J. and Montjoy, R. S. (1984) Interorganizational Policy Implementation: A Theoretical Perspective. *Public Administration Review*, 44(6), 491-503.
- Parker, G. and Doak, J. (2012) *Key Concepts in Planning*. London: Sage Publications.
- Parsons, W. (2007) Policy Analysis in Britain. In Fischer, F., Miller, G.J., and Sidney, M.R. (Eds.). *Handbook of Public Policy Analysis Theory, Politics, and Methods*. London: CRC Press.
- Patall, E.A. and Cooper, H. (2008) Conducting a Meta-Analysis. In Alasuutari, P., Bickman, L. and Brannen, J. (Eds.). *The SAGE Handbook of Social Research Methods*. London: Sage.
- Patomäki, H. and Wight, C. (2000) After Positivism? The Promises of Critical Realism. *International Studies Quarterly*, Vol. 4: 213-237.
- Patton, M.Q. (1999) Enhancing the Quality and Credibility of Qualitative Analysis. *Health Service Research*, Vol. 34(5): 1189-1208.
- Pellegrinelli, S. (2011) What's in a name: Project or programme? *International Journal of Project Management*, Vol. 29: 232-240.
- Pellegrinelli, S. (2008) *Thinking and Acting as a Great Programme Manager*. New York: Palgrave MacMillan.

- Pellegrinelli, S. (1997) Programme management: organising project-based change. *International Journal of Project Management*, Vol. 15(3): 141-149.
- Pellegrinelli, S., Partington, D., Hemingway, C., Mohdzain, Z., and Shah, M. (2007) The importance of context in programme management: An empirical review of programme practices. *International Journal of Project Management*, Vol.25: 41-55.
- Pentland, B.T. (2003) Conceptualizing and Measuring Variety in the Execution of Organizational Work Processes. *Management Science*, Vol. 49(7): 857-870.
- Persaud, N. (2010) Primary Data Source. In Salkind, N.J. (Ed.). *Encyclopaedia of Research Design*. London: Sage.
- Peter, M.K., Robert, M.M., and Lawrence, L.M. (2008) *Designing and Managing Programs: An Effectiveness-Based Approach*, 3rd edition. London: Sage.
- Pickton, D.W. and Wright, S. (1998) What's SWOT in strategic analysis? *Strategic Change*, Vol.7: 101-109.
- Piercy, N. and Giles, W. (1989) Making SWOT Analysis Work. *Marketing Intelligence and Planning*, Vol. 7(5/6): 5-7.
- Preissle, J. (2008) Ethics. In Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Pressman, J.L. and Wildavsky, A.B. (1973) *Implementation: How Great Expectations in Washington are dashed in Oakland*. Berkeley: University of California Press.
- Proeller, I. (2007) Outcome-Oriented in Performance Contracts: Empirical Evidence from Swiss Local Governments. *International Review of Administrative Sciences* Vol. 73(1): 95–111.
- Project Management Institute (2013) *A Guide to the Project Management Body of Knowledge*, 5th edition. Pennsylvania: PMI.
- Project Management Institute (2006) *The Standard for Programme Management*. Pennsylvania: PMI.
- Race, R. (2008) Literature Review. In Given, L.M. (Ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Rahmat, A.A. (2015) Policy Implementation: Process and Problems. *International Journal of Social Science and Humanities Research*, Vol. 3 (3): 306-311.

- Rainey, H. G., & Steinbauer, P. (1999) Galloping Elephants: Developing Elements of a Theory of Effective Government Organisations. *Journal of Public Administration Research and Theory*. Vol. 9(1): 1-32.
- Ray, D. and Ing, L.Y. (2016) Addressing Indonesia's Infrastructure Deficit. *Bulletin of Indonesian Economic Studies*, Vol. 52(1): 1-25.
- Reed, C.S. and Brown, R.E. (2001) Outcome-Asset Impact Model: Linking Outcomes and Assets. *Evaluation and Programme Planning* Vol.24: 287-295.
- Reichertz, J. (2014) Induction, Deduction, Abduction. In Flick, U. (Ed.). *The Sage Handbook of Qualitative Data Analysis*. London: Sage.
- Reilly, T. (2001) Collaboration in Action. *Administration in Social Work*, Vol.25 (1): 53-74.
- Reiss, G. (1996) *Programme Management Demystified: Managing Multiple Projects Successfully*. London: Taylor and Francis.
- Rol (2002) *Undang-undang Dasar Negara Republik Indonesia Tahun 1945* [1945 Constitution of the Republic of Indonesia] [online] Available from <http://www.dpr.go.id/jdih/uu1945> [accessed 28 May 2019]
- Rijke, J., van Herk, S., Zevenbergen, C., Ashley, R., Hertogh, M., ten Heuvelhof, E. (2014) Adaptive Programme Management through a Balanced Performance/Strategy Oriented Focus. *International Journal of Project Management*, Vol.32: 1197–1209.
- Robinson, M. (2007) Making Performance Budgeting Work. In Robinson (ed.): *Performance Budgeting: Linking Funding and Results*. Hampshire: Palgrave Macmillan.
- Rosef, K.E. (1970) Planning and PPBS with Particular Reference to Local Government. *Environment and Planning*, Vol. 2: 203-210.
- Rossi, P.H., Freeman, H.E. and Lipsey, M.W. (1999) *Evaluation: A Systematic Approach*, 6th edition. London: Sage Publications.
- Rowley, J. and Slack, F. (2004) Conducting a literature review. *Management Research News*, Vol. 27(6): 31-39.
- Royse, D., Thyer, B.A., and Padgett, D.K. (2010) *Programme Evaluation: An Introduction*, Fifth Edition. Belmont: Wadsworth.
- RTPI (2014) Thinking Spatially: Why places need to be at the heart of policy-making in the twenty-first century. *Planning Horizons*, No.1. London: RTPI.

- RTPI (2007) *Shaping and Delivering Tomorrow's Places: Effective Practice in Spatial Planning*. London: RTPI.
- Rukmana, D. (2015) The Change and Transformation of Indonesian Spatial Planning after Suharto's New Order Regime: The Case of the Jakarta Metropolitan Area. *International Planning Studies*, Vol. 20(4): 350-370.
- Rusmin, R., Astami, E.W., and Scully, G. (2014) Local Government Units in Indonesia: Demographic Attributes and Differences in Financial Condition. *Australasian Accounting, Business and Finance Journal*, Vol. 8(2): 88-109.
- Ryan, N. (1996) A comparison of three approaches to programme implementation. *International Journal of Public Sector Management*, Vol. 9(4): 34-41.
- Rydin, Y. (2011) *The Purpose of Planning: Creating Sustainable Towns and Cities*. Bristol: The Policy Press.
- Rydin, Y. (2003) *Urban and Environmental Planning in the UK*, 2nd edition. Basingstoke: Palgrave Macmillan.
- Saetren, H. (2005) Facts and Myths about Research on Public Policy Implementation: Out-of-Fashion, Allegedly Dead, But Still Very Much Alive and Relevant. *The Policy Studies Journal*, Vol. 33(4): 559-582.
- Sandy, W. (1991) Avoid the Breakdowns between Planning and Implementation. *Journal of Business Strategy*, Vol. 12 (5): 30-33.
- Savaya, R. and Waysman, M. (2005) The Logic Model. *Administration in Social Work*, Vol.29 (2): 85-103.
- Sayer, A. (1992) *Method in Social Science: A Realist Approach*, 2nd edition. Routledge: London.
- Schalock, R.L. (2002) *Outcome-Based Evaluation*, Second Edition. London: Kluwer Academic Publishers.
- Schein, E.H. (2010) *Organizational Culture and Leadership*, 4th edition. San Francisco: Jossey-Bass.
- Schensul, J.J. (2008) Methodology. In Given, L.M. (Ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Schick, A. (2002) Does Budgeting Have a Future? *OECD Journal on Budgeting* Vol. 2(2) pp.7-48.
- Schick, A. (1966) The Road to PPB: The Stages of Budget Reform. *Public Administration Review*, Vol. 26: 243-310.

- Schofield, J. (2004) A Model of Learned Implementation. *Public Administration*, Vol. 82 (2): 283–308.
- Secord, H. (2003) *Implementing Best Practices in Human Resources Management*. Toronto: CCH Canadian Ltd.
- Shao, J., Mueller, R. and Turner, J.R. (2012) Measuring Programme Success. *Project Management Journal*, Vol. 43(1): 37–49.
- Shehu, Z. and Akintoye, A. (2009) Construction programme management theory and practice: Contextual and pragmatic approach. *International Journal of Project Management*, Vol. 27: 703–716.
- Shiferaw, A.T. and Klakegg, O. J. (2012) Linking Policies to Projects: The Key to Identifying the Right Public Investment Projects. *Project Management Journal*, Vol. 43(4): 14–26.
- Skivington J.E. and Daft, R.L. (1991) A Study of Organizational Framework and Process Modalities for the Implementation of Business-Level Strategic Decisions. *Journal of Management Studies*, Vol. 28(1): 45–68.
- Smiraglia, R.P. (2014) *Cultural Synergy in Information Institutions*. London: Springer.
- Smith, T. B. (1973) The Policy Process Implementation. *Policy Sciences*, Vol.4: 197-209.
- Sowden, R. (2011) *Managing Successful Programme*, 4th edition. Norwich: Axelos.
- Stacey, R.D. (2011) *Strategic Management and Organisational Dynamics*, 6th edition: *The Challenge of Complexity*. London: Pearson
- Stake, R.E. (2010) *Qualitative Research: Studying How Things Work*. London: The Guilford Press
- Stead, D. and Meijers, E. (2009) Spatial Planning and Policy Integration: Concepts, Facilitators and Inhibitors. *Planning Theory & Practice*, Vol.10 (3): 317-332.
- Stebbins, R.A. (2008) Exploratory Research. In Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Sturup, S. (2009) Editorial, Planning, 'Program' and 'Project'. *Urban Policy and Research*, Vol 27(1): 1-3.
- Talen, E. (1996a) Do Plans Get Implemented? A Review of Evaluation in Planning. *Journal of Planning Literature*, Vol.10 (3): 248-259.
- Talen, E. (1996b) After the Plans: Methods to Evaluate the Implementation Success of Plans. *Journal of Planning and Education Research*, Vol.16: 79-91.

- Tarigan, A.K.M., Sagala, S., Samsura, D.A.A., Fiisabilillah, D.F., Simarmata, H.A., Nababan, M. (2016) Bandung City, Indonesia. *Cities*, Vol. 50: 100-110.
- Terpstra, J. and Havinga, T. (2001) Implementation between Tradition and Management: Structuration and Styles of Implementation. *Law and Policy*, Vol. 23 (1): 95-116.
- Tewdwr-Jones, M. (2012) *Spatial Planning and Governance: understanding UK Planning*. Hampshire: Palgrave Macmillan.
- Tewdwr-Jones, M. (2004) Spatial planning: principles, practices and cultures. *Journal of Planning and Environment Law*, p.560-569.
- Tewdwr-Jones, M., Gallent, N. and Morphet, J. (2010) An Anatomy of Spatial Planning: Coming to Terms with the Spatial Element in UK Planning. *European Planning Studies*, Vol.18 (2): 239-257.
- Thiry, M. (2016) *Program Management*. Oxon: Routledge
- Thiry, M. (2007) Programme Management: A Strategic Decision Management Process. In Peter W. G. Morris and Jeffrey K. Pinto (eds.). *The Wiley Guide to Project, Programme and Portfolio Management*. New Jersey: John Wiley and Sons, Inc.
- Thiry, M. (2004) Programme Management: A Strategic Decision Management Process. In Peter W. G. Morris and Jeffrey K. Pinto (eds.). *The Wiley Guide to Managing Projects*. New Jersey: John Wiley and Sons, Inc.
- Thompson, J. D. (1967) *Organisations in Action*. New York: McGraw-Hill.
- Thurmaier, K.M. and Willoughby, K.G. (2001) *Policy and Politics in State Budgeting*. London: M. E. Sharpe.
- Tjahjana, L., Dwyer, P. and Habib, M. (2009) *The Programme Management Office Advantage: A Powerful and Centralized Way for Organisations to Manage Projects*. New York: Amacom.
- Tomsa D. (2014) Party system fragmentation in Indonesia: the subnational dimension. *Journal of East Asian Studies*, Vol. 14(2): 249–278.
- Trifunovic, N. (2006) *Introduction to Urban Water Distribution*. London: Taylor and Francis.

- Turkulainen, V., Ruuska, I., Brady, T., and Artto, K. (2015) Managing project-to-project and project-to-organisation interfaces in programs: Organisational integration in a global operations expansion program. *International Journal of Project Management*, Vol.33: 816–827.
- UNDP (2009) *Handbook on Planning, Monitoring and Evaluating for Development Results*. New York.
- UNDP (1997) *Decentralized Governance Programme: Strengthening the Capacity for People-centred Development*. Geneva: UNDP Bureau for Development Policy. [Online] Available from: <ftp://pogar.org/LocalUser/pogarp/other/undp/decentralization/decenpro97e.pdf>. [Accessed 17 January 2019].
- United Nations (2008) *Spatial Planning: Key Instrument for Development and Effective Governance with Special Reference to Countries in Transition*. Geneva.
- Van de Ven, A.H., Delbecq, A.L., and Koenig Jr., R. (1976) Determinants of Coordination Modes within Organisations. *American Sociological Review*, Vol. 41 (2): 322-338.
- Van De Ven, A.H., Delbecq, A.L., and Koenig Jr, R. (1976) *Determinants of Coordination Modes within Organisations*. *American Sociological Review*, Vol. 41(2): 322-338.
- Van den Hoonaard, D.K. and Van den Hoonaard, W.C. (2008) Data Analysis. in Given, L.M. (ed.). *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage.
- Van Dooren, W., Bouckaert, G., and Halligan, J. (2010) *Performance Management in the Public Sector*, 2nd edition. London and New York: Routledge.
- Van Ginkle, C.H. (2015) *Water quality in the Bandung Basin: Towards a better understanding of the water quality in the Upper Citarum River Basin*. Bachelor Thesis: University of Twente.
- Vereecke, A., Pandelaere, E., Deschoolmeester, D., and Stevens, M. (2003) A classification of development programmes and its consequences for programme management. *International Journal of Operations & Production Management*, Vol. 23(10): 1279 – 1290.
- Vilanova, M.R.N., Filho, P.M., and Balestieri, J.A.P. (2015) Performance measurement and indicators for water supply management: Review and international cases. *Renewable and Sustainable Energy Reviews*, Vol.43: 1–12.

- Vizjak, A. (1994) Exploiting Your Synergy Potential: Promoting Collaboration between Business Units. *Long Range Planning*, Vol. 27(1): 25-30.
- Vogelsang, J.D. (2017) Complex Responsive Leading in Social Sector Organisations. In Tirmizi, S.A. and Vogelsang, J.D. (Eds.). *Leading and Managing in the Social Sector Strategies for Advancing Human Dignity and Social Justice*. Cham: Springer.
- Weiss, E.S., Anderson, R.M., and Lasker, R.D. (2002) Making the Most of Collaboration: Exploring the Relationship between Partnership Synergy and Partnership Functioning. *Health Education and Behavior*, Vol. 29 (6): 683-698.
- West, W.F. (2011) *Programme Budgeting and the Performance Movement: The Elusive Quest for Efficiency in Government*. Washington: Georgetown University Press.
- Whelan, C. (2016) Organisational culture and cultural change: A network perspective. *Australian and New Zealand Journal of Criminology*, Vol. 49(4): 583–599.
- Wijnen, G. and Kor, R. (2000) *Managing Unique Assignments: A Team Approach to Projects and Programmes*. Hampshire: Gower.
- Wildavsky, A. (1973) If Planning is Everything, Maybe it's Nothing. *Policy Sciences* Vol.4: 127-153.
- Williams, D. and Parr, T. (2004) *Enterprise Programme Management: Delivering Value*. Palgrave Macmillan.
- Winter, S.C. (2012) Implementation, in Peters, B.G. and Pierre, J. (eds.): *The Sage Handbook of Public Administration*, 2nd edition. London: Sage Publications.
- WJPG (2016) *Reviu Draft Rencana Induk Pengembangan SPAM Metropolitan Bandung 2010-2030* [Reviewed Draft Master Plan of the Regional Water Supply System Metropolitan Bandung 2010-2030] [unpublished report]
- WJPG (2013) *Peraturan Daerah Provinsi Jawa Barat No.25/2013 tentang Rencana Pembangunan Jangka Menengah Daerah Provinsi Jawa Barat 2013-2018* [West Java Provincial Regulation No.25/2013 regarding West Java Province Medium-Term Development Plan 2013-2018]
- WJPG (2010a) *Draft Rencana Induk Pengembangan SPAM Metropolitan Bandung 2010-2030* [Draft Master Plan of the Regional Water Supply System Metropolitan Bandung 2010-2030] [unpublished report]

- WJPG (2010b) *Peraturan Daerah Provinsi Jawa Barat No.22/2010 tentang Rencana Tata Ruang Provinsi Jawa Barat 2009-2029* [West Java Provincial Regulation No.22/2010 regarding West Java Provincial Spatial Plan 2009–2029]
- Wong, C. And Watkins, C. (2009) Conceptualising spatial planning outcomes: Towards an integrative measurement framework. *The Town Planning Review*, Vol. 80(4/5): 481-516.
- World Bank (2017) *Improving Service Levels and Impact on the Poor: A Diagnostic of Water Supply, Sanitation, Hygiene, and Poverty in Indonesia*. Washington DC: World Bank.
- World Bank (2016) *More and Better Spending: Connecting People to Improved Water Supply and Sanitation in Indonesia*. Jakarta: World Bank.
- World Bank (2003) *Decentralizing Indonesia: A Regional Public Expenditure Review Overview Report*. Report No. 26191-IND.
- Woltjer, J. and Al, N. (2007) Integrating Water Management and Spatial Planning. *Journal of the American Planning Association*, Vol. 73(2): 211-222.
- Yang, K. (2007) Quantitative Methods for Policy Analysis. In Fischer, F., Miller, G.J., and Sidney, M.R. (eds.): *Handbook of Public Policy Analysis Theory, Politics, and Methods*. London: CRC Press.
- Yin, R.K. (2011) *Qualitative Research from Start to Finish*. London: The Guilford Press.
- Yin R.K. (1994) *Case Study Research: Design and Methods* (2nd Ed.). London: Sage Publications.
- Zhong, H., Levalle, R.R., Moghaddam, M., and Nof, S.Y. (2015) Collaborative Intelligence – Definition and Measured Impacts on Internetworked E-Work. *Management and Production Engineering Review*, Vol. 6(1): 67–78.
- Zuiderwijk, A. and Janssen, M. (2013) A Coordination Theory Perspective to Improve the Use of Open Data in Policy-Making. In Wimmer, M.A., Janssen, M., and Scholl, H.J. (eds.): *Electronic Government*. London: Springer.
- Zwetsloot, G. (1995) Improving cleaner production by integration into the management of quality, environment and working conditions. *Journal of Cleaner Production*, Vol. 3(1/2): 61-65