university of groningen

faculty of spatial sciences

Indri Kurnia

Assessing Transaction Costs in Inter-municipal Cooperation

Case study Payakumbuh Regional Landfill

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Author Indri Kurnia
S2446154
i.kurnia.1@student.rug.nl
indri.kurnia@yahoo.co.id

Supervision prof, dr, Johan Woltjer
Ibnu Syabri, B.Sc.,M.Sc.,Ph.D.

University of Groningen
Faculty of Spatial Sciences

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This is not the end but only the start

Groningen, August 2014

Abstract

Developing a regional landfill is an option to address the challenge of local governments in providing better landfill system. Regional landfill cooperation can be seen as an inter-municipal cooperation in solid waste management when two or more local governments agree to cooperate in developing a sanitary landfill. While inter-municipal cooperation is potentially can address the regional issues, it is also limited by transaction cost problems. Transaction costs are incurred through the processes of information searches required in making decisions, along with those of negotiating, monitoring, and enforcing agreements. Therefore, this research aims to provide set of arguments for understanding the role of transaction costs in the phenomenon of inter-municipal-cooperation particularly in developing a regional landfill. Through the application of Q-methodology in the case of Payakumbuh Regional Landfill, this research identifies five actor's perception systems, i.e. concluding the agreement; socialization to the local people; land development process; information about the importance of regional landfill; monitoring and enforcement the agreement, as factors that generate high transaction costs during the processes. This research concludes that the issue of land development and property right as the unique characteristic in developing the Payakumbuh Regional Landfill. Several policy recommendations helps to fit the strategy to improve cooperation including giving socialization and training; encouraging local government for a voluntary agreement; and creating forms of governance to control land development process. These policy recommendations could help the stakeholders to reduce uncertainties and thus lowering transaction costs.

Keywords: transaction costs, inter-municipal cooperation, regional landfill, land development

Chapter 1
Introduction

1.1. Background

Municipal solid waste is one of the most challenging issues for city administrators in urban areas in developing countries. Rapid growth of population and the increase of activities in major cities cause the inclination of the amount of waste generation and all of the inherent consequences. In the meantime, it is often found that local governments put low priority on waste handling mainly due to the lack of funding and the limited number of skilled human resources. These attitudes result in the low performance of solid waste management in urban area (Damanhuri, 2008). Hence, most of the cities in the developing countries tend to apply open dumping landfill system for solid waste management (Kardono and Purwanta, 2007).

Open dumping landfill system contributes to environmental problems such as local air pollution due to uncontrolled burning, vector borne diseases, and sanitation/hygiene. Besides, the generation of methane and carbon dioxide which resulted from decomposition of organic matter would also result in negative impacts such as an explosion. The accident of 8 September 2006 in Leuwigajah Landfill, Bandung, in which there was a sudden explosion when this landfill experienced landslide can be taken as an example of the said negative impact. Such an explosion was triggered by the disturbance of waste piles stability that already reached unstable state, which finally triggered further landslides. The said accident led to a collapse to a 50 meter high mountain of wastes subsequently, caused injuries and deaths to 143 people (Damanhuri, 2008).

To overcome this issue, the Government of Indonesia has decided to develop sanitary landfills as a means to alleviate the waste dumping practices. This development was basically conducted to respond the new Waste Management Law No.18/2008[1]. This Law seeks to realize the efforts of environmental-friendly waste management, by encouraging local governments to plan sanitary landfill. The sanitary landfills will be equipped with lining, soil protection, ground water monitoring, as well as landfill gas processing (IndII, 2011).

[1] Waste Management Law No. 18/2008 regulates implementation of environmentally friendly solid waste management. It covers public service principles, waste minimization and handling of domestic solid waste and specific waste, incentives and disincentives mechanism, local government responsibility, financial system, private and public sector participation, and sanctions.

Before the implementation of decentralization, municipal solid waste management was the responsibility of central government. In other words, since decentralization in 1999, waste handling was not only become responsibilities of central government but also the local governments. Since then, the local governments has become the key players that responsible in planning and implementing solid waste management in their locality while central government plays role as a regulator (Meidiana, 2010). However, developing a sanitary landfill is not an easy task especially for medium and small municipalities. According to Zhu, et al (2008) the challenges are related to finding the appropriate land, getting enough funds for the construction and operation, finding the technical personnel, and fighting the reaction from the neighbourhoods surrounding landfill location.

Inter-municipal cooperation has become one tool to assist in addressing these challenges. As mentioned by DiNapoli (2009), since the responsibilities has increased, the local governments started to make cooperation and share services with others in order to reduce or avoid costs, improve service delivery, or maintain services. In the case of solid waste management, regional landfill cooperation can be seen as an inter-municipal cooperation when two or more local governments agree to cooperate in developing a sanitary landfill. Developing a regional landfill will become increasingly important as large appropriate landfill sites become more difficult to find, and the technology to manage the waste becomes more complex (IndII, 2012).

1.2. Research Problem

Developing a regional landfill in Indonesia is not without any obstacles. Since the enactment of Waste Management Law No.18/2008, the Government through Ministry of Public Works has developed several regional landfill projects. However, in practice, only small number of regional cooperation can be implemented successfully, both operationally and administratively. Factually, local governments were taking longer time in concluding the cooperation agreements. The main problem in inter-municipal cooperation is how to coordinate actions and accommodate various interests in the area of cooperation. As argued by DiNapoli (2009), compared to individual municipal programme, inter-municipalities programme often takes longer time to be established since the programme involves more stakeholders and needs more approvals.

If the economic benefits are highly visible due to the fact that inter-municipal cooperation tends to provide services at a cost lower than that of individual municipal programme, there must be other factors which responsible to cause difficulties in concluding the agreements. Feoick (2007) explains that there are transaction costs incurred during the process of searching information required to make decisions, along with the process of negotiating, monitoring, and enforcing agreements. In practice, transaction costs usually are not included in empirical evaluations of alternative planning policies. McCann et al (2005) suggest that transaction costs measurement should be taking into account within the full benefit-cost analysis of a proposed policy since the mere cost-effectiveness measurement is not sufficient. Hence, assessing transaction costs is an important element for decision makers prior to the initiation of the cooperation.

With regard to this issue, it is also important to study about the role of transaction costs in inter-municipal cooperation in the context of regional landfill. Nowadays, there is a growing number of literature reporting the extent of transaction costs in inter-municipal cooperation (Kruiger and Mc. Guire, 2005; Shrestha, 2005; Wukich, 2011). Nevertheless, the literature related to the role of transaction cost in the context of developing a regional landfill is scarce. Whereas transaction costs is one important aspect that should be considered in establishing inter-municipal cooperation; therefore, understanding key elements that influence transaction costs would be an important step in order to set the strategy to improve inter-municipal cooperation as preconditions to develop regional landfill.

1.3. Research Objectives

Transaction cost is one important aspect that should be considered in establishing inter-municipal cooperation. Yet, transaction costs as potential barrier in inter-municipal cooperation in the specific context of developing a regional landfill has barely considered to be evaluated. Thus, this research is expected to fill the gap. This research aims to scrutinise the role of transaction costs in the phenomenon of inter-municipal-cooperation particularly in developing regional landfill. The application of transaction costs theory in inter-municipal cooperation will be examined in order to get some recommendations for policy makers to improve the regional landfill cooperation in Indonesia by using Payakumbuh Regional Landfill Cooperation as a case study.

1.4. Research Questions

This research will explain *"To what extent the role of transaction costs in developing a regional landfill cooperation?"* In order to generate answer to this broad question, I employ three research questions as follows;

1. What are transaction costs? What are the roles of transaction cost in inter-municipal cooperation, particularly in regional solid waste management?
2. How is the implementation of inter-municipal cooperation in developing the Payakumbuh Regional Landfill currently done?
3. In developing the Payakumbuh Regional Landfill, in which step of cooperation do the transaction costs occur? What are the perceptions of the actors towards these elements of transaction costs?
4. How does the explanation about the role of transaction costs improve regional landfill cooperation practice in Indonesia?

1.5. Research Methodology

This research is a qualitative research that will be conducted through the case study methodology. The research uses Payakumbuh Regional Landfill Cooperation as single case study. As can be seen in Table 1.1, data are collected from the three local governments as well as provincial and central government. From these wards, data collected consist of primary data and secondary data including document reports, archives, and online newspapers.

The research questions will be handled using quantitative and qualitative data collection techniques and analysed based on primary and secondary data. Several methods are used in answering these research questions.

Research Question 1

> *"What are transaction costs? What are the roles of transaction cost in inter-municipal cooperation, particularly in regional solid waste management?"*
>
> To answer this question, this research takes the data based on literature review. Information will be collected from several articles, journal, books related to inter-municipal cooperation, transaction cost, and solid waste management.

Research Question 2

"How is the implementation of inter-municipal cooperation in developing the Payakumbuh Regional Landfill currently done?"

To answer this question, this research will figure out the process in implementing inter-municipal cooperation in developing the Payakumbuh Regional Landfill. It can be analysed from related laws and regulations and document reports. These data will be collected from Ministry of Public Works, Provincial Government, and Local Governments.

Research Question 3

"In developing the Payakumbuh Regional Landfill, in which step of cooperation do the transaction costs occur? What are the perceptions of the actors towards these elements of transaction costs?"

Based on literature and conceptual framework, this research will identify in which step of cooperation that transaction costs occur in implementing inter-municipal cooperation in developing the Payakumbuh Regional Landfill. Because this research is related to the stakeholders' perception about the elements of transaction costs, hence Q-methodology is conducted in order to show and analyse the stakeholders´ perspective. The primary data are collected through Q-sort from selected respondents. In addition, content analysis of the secondary data is used to gain more explanation. Several data related information about Payakumbuh Regional Landfill, including document reports, archives records, and online newspaper, will be collected.

Research Question 4

"How does the explanation about the role of transaction costs improve regional landfill cooperation practice in Indonesia?"

The answer of this research question is concerned with summarising research finding and using them as policy recommendation.

Table 1.1 Methodology

Objectives	Data Requirements	Sources of Data	Method of Data Collection	Method of Analysis	Output of Analysis
To identify transaction cost in inter-municipal cooperation, particularly in regional solid waste management	Literature in transaction costs, inter-municipal cooperation, and solid waste management	- International JournalsBooks	· Literature review	Descriptive analysis	The concept of transaction costs in inter-municipal cooperation, particularly in regional solid waste management
To understand the implementation of inter-municipal cooperation in developing the Payakumbuh Regional Landfill	Secondary data : - Document report - Law and Regulation	- Ministry of Public Works - Provincial Government - Local Governments in five municipalities	· Document review	Case Study Method Descriptive Analysis Content analysis	Information about implementation of inter-municipal cooperation in developing the Payakumbuh Regional Landfill
To identify transaction costs in developing the Payakumbuh Regional Landfill and perceptions of the actors towards these elements of transaction costs	Primary data : - Q-sort Secondary data : - Archival Records - Document reports - Online Newspaper - Internet Sources	- Ministry of Public Works - Provincial Government - Local Governments (three municipalities) - Internet Sources	· Q-methodology · Document review	Q-sort analysis Content analysis DescriptiveAnalysis Q-sort Analysis	The transaction costs that occur and actors' perception towards elements of transaction costs in developing the Payakumbuh Regional Landfill

1.6. Research Structure

This research will be elaborated in six chapters. The content of each chapter is described as follows:

Chapter 1: Introduction

This chapter encompasses background, research problem, research objectives, research questions, research methodology, and research structure. This chapter illustrates the background of the research and the reason behind conducting the research.

Chapter 2: Literature Review

This chapter discusses the theoretical concepts of this research. First, this chapter explains the issues and challenges of municipal solid waste management. Second, this chapter explains concept of Inter-municipal cooperation. Third, there will be explanation of regional landfill concepts. Fourth, this chapter discusses transaction cost theory related to Inter-municipal cooperation as the central issue of this research. Fifth, there will be explanation of the application of transaction costs theory in land use planning and development. This chapter ends up by the conceptual framework as a guideline to conduct this research.

Chapter 3: Research Methodology

This chapter gives further explanation of the methodology that conducted to answer research questions.

Chapter 4: Payakumbuh Regional Landfill Cooperation: a Case Study

This chapter describes the overview of Payakumbuh Regional Landfill as one of the practices of Inter-municipal cooperation in solid waste management. This chapter provides several data related the implementation of project taken from document reports, laws and regulations, and archives.

Chapter 5: Assessing Transaction Costs in Developing the Payakumbuh Regional Landfill Cooperation

Based on the data provided, this chapter will identify in what stages that transaction costs occur in implementing inter-municipal cooperation in developing the Payakumbuh Regional Landfill. Next to that, this chapter provides set of arguments based on literature review to understand the role of this transaction and actors' perception towards the element of transaction costs.

Chapter 6: Conclusion and Recommendation

The final chapter consists of conclusion, recommendation, and reflection of the research. This chapter will provide some policy advice for decision makers in order to establish better regional landfill cooperation.

Figure 1.1 illustrates research framework describing the steps that will be taken in this research.

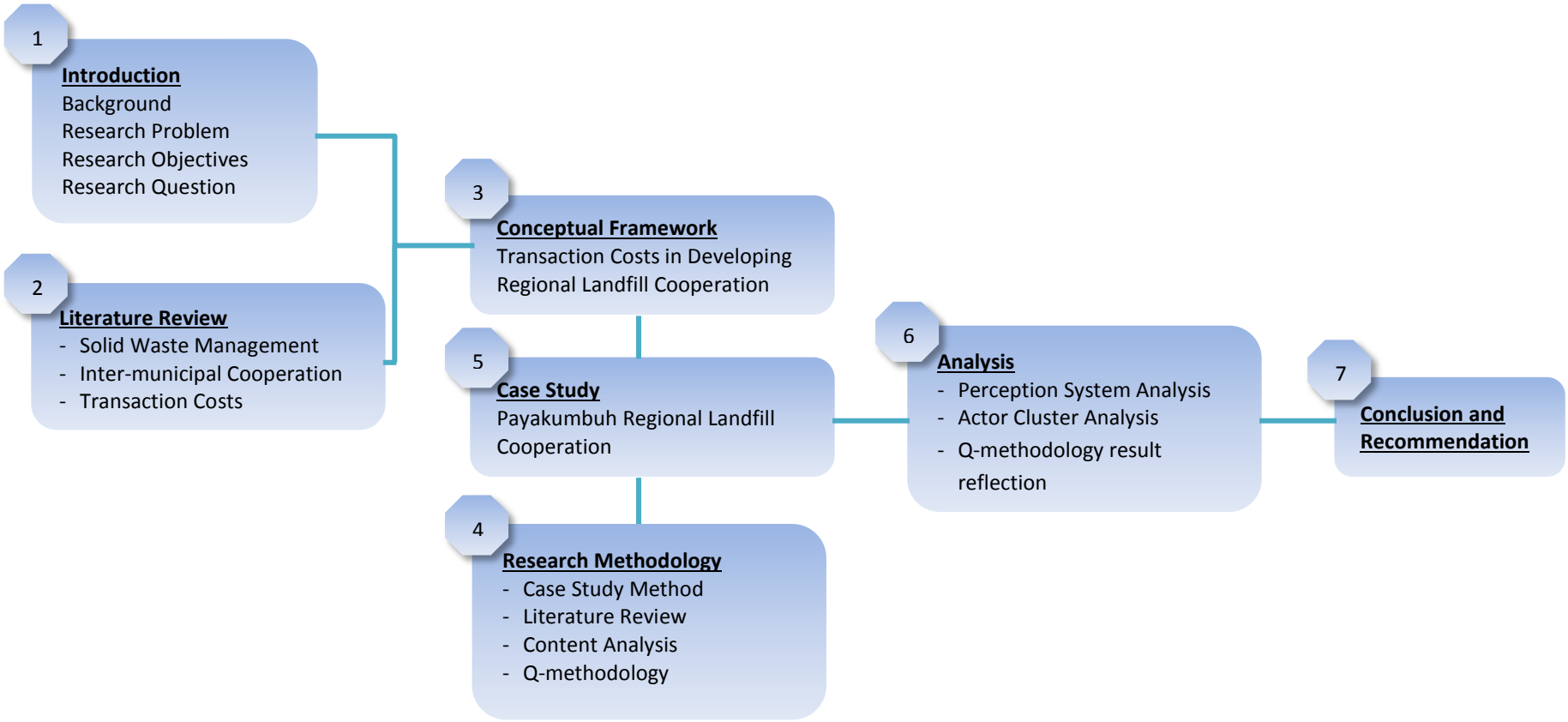

Figure 1.1 Research Framework

Chapter 2
Literature Review

2.1. Introduction

The purpose of this chapter is to provide theoretical background as a foundation for this research. This chapter will start on the issues and challenges involved in the management of municipal solid waste. Providing proper disposal waste has become one of main issues that faced by most cities especially in developing countries. This situation triggers local governments to cooperate with others in regional landfill concept in order to reduce or avoid costs, improve and maintain services. In the next part, this chapter explains transaction costs that would become an obstacle in inter-municipal cooperation. The subsequent section will explain about application of transaction cost theory (TCT) particularly in land use planning and development. Based on this theoretical background, I end up this chapter with a conceptual framework that will be used for further analysis of this research.

2.2. Issues and Challenges in Municipal Solid Waste Management

Tchobanoglous (1993) describes solid waste as any residue of human and animal activities that are normally solid and discarded as unused or unwanted. There are many sources and activities that generate waste including non-hazardous industrial, commercial and domestic waste such as household organic trash, street sweepings, institutional garbage, and construction wastes (Zerbock, 2003). Municipal solid waste management (MSWM) is a complex and expensive exercise. According to Schübeler (1996), MSWM is defined as steps of technology including collection, transfer, treatment, recycling, resource recovery and disposal of solid waste in urban areas.

Local government has responsibility in providing basic services including conserving the living environment to protect the public health of city residents. Hence, MSWM is closely related to public health and well-being, the quality and sustainability of the urban environment, and indirectly will affect to the efficiency and productivity of the urban economy (Schübeler, 1996). Furthermore, MSWM does not merely associate with technical

issues, but as suggested by Schübeler (1996), the successful of MSWM should associate interdisciplinary that integrate technical, social, financial, and institutional aspect.

In practice in most cities in developing countries, it is found that MSWM is inadequate (Damanhuri, 2008). There are many issues and challenges in MSWM especially in providing proper disposal waste due to the attitudes of most of local governments that put less attention over it. It is often found that the local government would put waste handling at the lowest priority level, and consider a landfill as the last priority. In addition, lack of skilled human resources, lack of finding or even more, lack of enforcement by the responsible administration make situation even worse (Damanhuri, 2008). Therefore, open dumping tends to be a general practice in most cities in developing countries (Kardono and Purwanta, 2007). This system contributes to environmental problems such as local air pollution due to uncontrolled burning, vector borne diseases, sanitation/hygiene, and even explosion of methane concentrated (Damanhuri, 2008).

2.3. Regional Landfill Concept

Sanitary landfills have been developed as a means to minimize the open dumping practices. Sanitary landfill is considered as environmental-friendly technology since the system will be equipped with lining, soil protection, ground water monitoring, and landfill gas processing (IndII, 2011). Unfortunately, these regulations which specify minimum criteria for location, design, operation, open dumping closure can be extremely difficult for medium or small municipalities. Finding land, building a sanitary landfill, and running the operations are likely to increase the cost of MSWM. Getting sufficient funds for the construction and operation, finding the technical personnel to operate the heavy machinery, and fighting from reaction of the neighbourhoods where the landfill is located will become challenges (USEPA, 1994).

Setting up and operating a sanitary landfill is a complex and expensive exercise. Typically, a sanitary landfill is economically viable if it has a minimum capacity of 250 to 300 tons per day (Zhu et al, 2008). This requirement is not viable for cities that have small population. Furthermore, the costs that have to be paid by municipalities for providing technical experts of technical inputs, development of facilities and maintenance for long term are very expensive. In this case, instead of creating small own facilities, developing a regional landfill

is expected to be cost effective especially for medium and small municipalities (Gallagher, 1994). It enables two or more municipalities to derive the benefit of economy of scale by coming together (Zhu et al, 2008).

Regionalization can be a viable solution in MSWM. Government of NewFoundland and Labradar (2002) defines a regional waste management system is a formal partnership among incorporated communities, municipalities, and unincorporated areas to provide integrated waste management services. This partnership allows municipalities to pool resources and to share what is difficult to do by the city itself. In the context of providing proper disposal facility, regionalization refers to the bundling the waste disposal needs of municipalities and overcoming the problem together by creating one regional facility (Zhu et al, 2008). Regional landfill will become increasingly important as large suitable disposal sites become more difficult to find, and as the technology to manage the waste becomes more complex (IndII, 2012). This approach also helps to dramatically reduce the number of waste disposal sites. Hence, regionalization means that each region does not necessarily have a disposal facility.

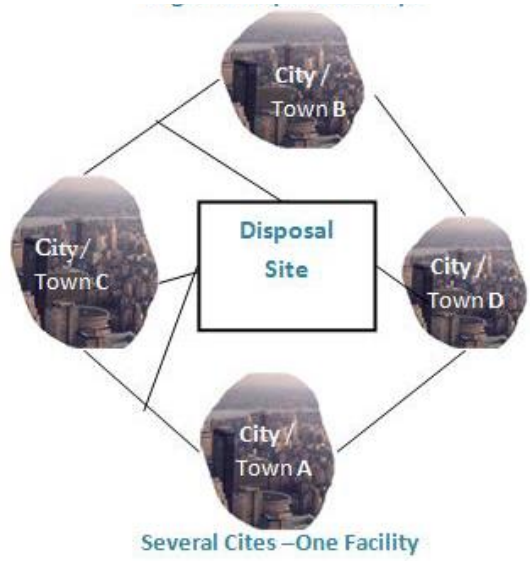

Figure 2.1 Regional Landfill Concept
source: Sahu, n.y

Due to the fact that regional landfill involves many stakeholders, it is important for city participant to create an institutional arrangement before deciding to establish such a regional landfill. Several aspects including cost sharing, contracting, negotiating, and monitoring should be considered (Zhu et al, 2008). Hence, creating Memorandum of Understanding

(MoU) become crucial point, it should cover all issues of waste disposal and must be agreed by the parties involved.

Regional landfill is only possible for cities that are close together and have good accessibility. Therefore, availability of land is one technical aspect that needs to be prepared. Geographic Information System (GIS) can be helpful in order to identify appropriate landfill location. Land can be provided either by central government, one of city participants, private sectors, or acquired by a particular authority. For some reasons, land that is already within the possession of particular authority may be preferred over lands that need to be acquired. The important thing is the landownership should be clear and it should be ensured that land use cannot change during the project (Ministry of Urban Development, Government of India).

Management and operational of regional landfill is handled proffesionally, in which the costs is shared by the city participants in proportional tipping fee depends on the amount of waste delivered to the landfill site (USEPA, 1994). Other various financing options are also available for the construction, operation, and maintenance. The budget could come from the central government, the state government, or private investors (Zhu et al, 2008).

The success of a regional landfill is also supported by sharing information and community participation (Zhu et al, 2008). Through public education and socialization, municipalities should inform the benefits of this project to the local people. Another example is by giving assistance to them about opportunity to gain income from recycling activity in landfill. In addition, various societal groups could be involved to contribute during planning process.

Nowadays, regional landfill has become a common practice and has received considerable attention due to its success. Regional landfills are being implemented not only in developed countries such as the United States, the United Kingdom, Germany, Sweden, and Poland, but also in developing countries such as India, Argentina, Brazil, Mexico, Palestine, and Egypt (Sahu, ny).

Despite the benefits, there are also challenges in implementing regional landfill concept that need to be addressed. According to Zhu et al (2008), the main challenge is potential conflict of interest among city participants. On the one hand, municipalities get benefits from not having to site and manage the landfill within their jurisdictions but they have to pay more to

the municipality in which landfill site is located. On the other hand, the municipality that hosts the site gets benefits from cheaper waste disposal and fees that they gain from other municipalities. However, there is potential conflict related to sitting landfill site within its jurisdiction.

Other factors to consider are environmental and social impacts of regional landfill. Environmental problems include congestion, pollution, and road-way wear and tear as consequences of transport of waste across jurisdictions (Zhu et al, 2008). In addition, leachate and landfill gas also have potential to contribute environmental damage (Hirshfeld et al, 1992). Social impacts are related to landfill's existence include adjacent property depreciation (as the effect of environmental degradation) and land opportunity cost. These problems are affected tipycally by those residents living close to the landfill site (Hirshfeld et al, 1992).

2.4. Inter-municipal Cooperation

Over decades, municipalities have faced increasing demands and standards in providing local public goods and services for citizens (Hulst and Montfort, 2007). Population growth along with fiscal pressure forces municipalities are required to find alternative solution for effective public service provision (Blaeschke, 2014). One of the strategies to cope with these issues is inter-municipal cooperation. According to Hulst and Montfort (2007), inter-municipal cooperation is cooperative arrangement between municipalities, between municipalities and other public authorities, and between municipalities and private sectors.

Inter-municipal cooperation is an effective way for municipalities to overcome issues of mutual concern and issues that surpasses jurisdictional boundaries that could not be solved individually (Feiock, 2004; Hulst and Montfort, 2007; MCDP, 2010). Through cooperation, the municipalities work together in providing better public services as a respond to the citizen's needs and with the aim of local development (Council of Europe, 2008).

The benefit of the inter-municipal cooperation is it provides the participants an opportunity to assess by themselves the costs and benefits of participation in the solution of mutual problems without interference of central government. Shrestha (2005) points out that the role of central government in institutional collective action is considered to be minimal and

limited to creating facilitating institutional rules such as granting home rule authority to local governments for efficient inter-municipal cooperation. DiNapoli (2009) argues that shared services can help municipalities increase effectiveness and efficiency in their operation. As local governments' responsibilities become increasingly complex and demanding, they should explore shared services and other cooperative opportunities in order to reduce or avoid costs, improve service delivery, or maintain services. One tool to assist in addressing this challenge is inter-municipal cooperation.

According to UNDP (2006), there are five types of inter-municipal cooperation arrangements that considered as the most commonly used in international practice. These are:

1. Joint Service Production (Joint Agreements) – formation of joint enterprises or agencies for certain services (as water supply or road maintenance).
2. Joint (Shared) Administration – formed for performance of certain competencies, mainly of an administrative nature, such as tax collection and administration, physical planning, licensing of various types.
3. Selling and buying of services (Service Agreements) – this may include provision of services to weaker municipalities for which a fee is paid.
4. Joint planning and development – in cases where small municipality has lack of capacity to perform the competency alone, such as local economic development.
5. Joint funding – in cases municipalities (or municipalities together with an upper level of government) are jointly funding a mutually useful investment

2.5. Transaction Costs in Inter-municipal Cooperation

Inter-municipal cooperation could be viewed as their free to choose decision based on cost-benefit consideration (Feiock, 2004). Inter-municipal cooperation involves voluntary transactions between two or more local governments to accomplish common goals. Inter-municipal cooperation does not require costly centralized solutions or political consolidation. Instead, local governments gain economies of scale and devise acceptable compensation to internalize positive or negative externalities through mutual bargaining (Feiock, 2005).

While inter-municipal cooperation is potentially can address the regional issues, it is also limited by transaction cost problems (Carr et al, 2007). Shrestha (2005) argues that these include problems related to the transaction cost properties of public goods and services, and

problems of trust and commitment related to the service network relationships in which a local government is imbedded.

The concept of transaction costs was proposed by Ronald Coase, known as "Coase Theorem": absent transaction costs, rational actors will achieve a Pareto-efficient allocation[1] of resources through voluntary bargaining even in the presence of positive or negative externalities. Further, when transaction costs of cooperative agreements are low, local governments can enter into a cooperative agreement through mutual bargaining (Bish, 1971).

Transaction costs are incurred through the processes of information searches required to make decisions. According to Wukich (2011), it includes the costs in terms of time, energy, information, and resources that can probably inhibit cooperation. Feiock (2005) classifies transaction costs into four elements. In the context inter-municipal cooperation, the elements of transaction costs can be explained as follows:

1. Information Costs-associated with the costs in determining the areas to collaborate, finding potential partners, searching information on the preferences of all participants over possible outcomes, determining the potential cost savings.
2. Agency Costs-associated with educating and notifying constituents, negotiating with opponents, and shepherding collaborative ideas through decision making process.
3. Negotiation/Division Costs-associated with the process of negotiating an agreement must be small and the parties must be able to agree to a division of the bargaining surplus
4. Enforcement Costs–there associated with monitoring and ensuring the party sticks to the term of agreement and taking appropriate action if activities deviate from initial plan.

Level of these transaction costs will depend on the characteristics of the good or service in exchange (Carr et al, 2007).

The type of transaction costs can be explained as ex-ante and ex-post transaction cost (McCann et al, 2005; Slangen et al, 2008). Ex-ante cost arises before the transactions or agreement occurs. It includes information cost, negotiation cost, and agency cost. Meanwhile

[1] Pareto-efficient allocation refers to situation in which there is no feasible alternative that keeps all individuals as least as well off but makes at least one person better off (Slangen et al, 2008)

enforcement cost is categorized as ex-post transaction cost. This cost occurs after the closure of transaction or agreement.

Transaction costs affect the tendency of local government to enter into collaborative agreements. Kruiger and Mc. Guire (2005) suggest that low transaction costs allow for easier agreement since local governments have higher motivations to pursue such agreements. Conversely, high transaction costs make such agreements be more difficult. In line with this, Blaeschke (2014) says that collective action takes place if the expected benefits exceed the total costs including transaction cost. Therefore, Feiock (2007) notes that transaction costs need to be kept low in order for benefits to exceed the costs of make collective action, so that the local governments will have greater willingness to cooperate (Feiock, 2004).

2.6. Transaction Costs in Land Use Planning and Development

Transaction costs theory (TCT) has traditionally been applied to firms and markets. In 1992, Alexander through the article "A transaction cost theory of planning" introduced the consideration of transaction costs in planning. Since then, TCT is also applicable to the institutional analysis in the public sectors including contracting among governmental (Alexander, 2001b; Brown and Potoski 2003).

Alexander (2001a) shows the TCT application in the area of land use planning and development. In his article, Alexander explains that transaction costs occur during the processes of land development including land acquisition/assembly, financing, land preparation/development, land disposition, construction, and property transfer. TCT explanation will be useful to identify alternative forms of governance as a step towards institutional design in order to minimize transaction costs.

Alexander (2001a) defines a transaction as an exchange of resources (goods and services) between parties. In line with this, McCann et al (2005) define transaction costs as the costs of resources to establish, maintain, and transfer property right. In this a market-like interaction, Buitelaar (2004) explains that transaction costs occur due to imperfect rationality and assymetric information. Moreover, there are bounded rationality and opportunism. Bounded rationality means that people have limitation of knowledge about transaction, and it can be reduced by learning from past experiences (Coggan et al, 2010; 2013). Meanwhile

opportunism refers to self-interested behavior which includes providing distorted information (Slangen et al, 2008). Transaction costs are incurred due to the time and effort consumed to formed complete contracts or increased monitoring to manage the risks of this opportunistic behavior (Coggan et al, 2010; 2013).

Transaction costs in land development would be higher due to interdependence, uncertainty, and timing as explained by Alexander (2001a) as key transactions dimensions. Coggan et al, 2010; 2013 describe these three keys as factors that influence the characteristic of transaction. Interdependence in TCT is known as asset specificity (Alexander, 2001a) refers to the degree to which a resource is committed to a specific task and thus cannot be redeployed to alternative uses without a substantial reduction in its value (Slangen et al, 2008). Asset specificity can be related to specific investments in capital, technology, information, and human resources (Alexander, 2001a; Coggan et al, 2010; 2013). Another key transaction dimension is uncertainty resulted in limited or asymmetric information about a transaction (Alexander, 2001a). In this situation, there is lack of transparency (Alexander, 2001a) since not all the parties involved have the same information (Slangen et al, 2008). As a consequence, it may impose information and monitoring cost (Alexander, 2001a; Coggan et al, 2010; 2013). The final key transaction dimension that influences transaction costs is timing/frequency of a transaction. According to Coggan et al (2010) when transactions are recurring, a suitable contract can reduce the transaction costs due to reduced efforts required for each individual transaction.

2.7. Conceptual Framework

This research tries to elaborate the concept of transaction cost in inter-municipal cooperation, in the context of developing a regional landfill. Related theoretical background has been explained in the previous section. This basic theoretical view is needed in order to develop a conceptual framework that will be helpful in answering the research question.

As previously explained, the issues and challenges that faces by local government in many cities in providing adequate proper waste disposal has forced them to find an alternative solution. Through the concept of inter-municipal cooperation, two or more municipalities agree to work together in order to develop regional sanitary landfill. One the one hand regional landfill is expected to be more cost-effective and will benefits both technically and

environmentally. However, developing this type of cooperation is not an easy task. There are transaction costs that arise through information searches required to make decisions include information costs, negotiation costs, agency costs, and monitoring costs (Feiock, 2005). Understanding transaction cost theory, therefore is relevant to explain the dynamic of inter-municipal cooperation in developing regional landfill.

Transaction costs theory will be applied as guidance to conduct this research by providing conceptual framework that focus on the transaction costs elements. As mentioned by Shrestha (2008), transaction costs elements are determined by characteristic of goods and services. In the context of regional landfill cooperation, I expect that negotiation related to asset specificity is considerably contributing higher cost than other step of cooperation. This is because, setting up and operating a regional landfill is a complex and expensive exercise. Specific requirements are needed in developing regional landfill. Moreover, regional landfill means that one of city participants has to provide a parcel of land for landfill location, which is in turn, can generate conflict related to land asset. However, this basic assumption has to be proven through this research.

Identifying transaction costs elements in public policies could be done by transaction costs measurement. Hence, it is important to categorize the type of transaction costs. According to McCann et al. (2005), transaction costs associated with public policies will include:

- Research, information gathering, and analysis associated with defining the problem.
- Enactment of enabling legislation, including lobbying and public participation costs, or, alternatively, the costs of changing laws through the courts or modifying existing regulations.
- Design and implementation of the policy, which may include costs of regulatory delay.
- Support and administration of the on-going program.
- Contracting costs, which may include additional information costs, bargaining costs, and decision costs, which are relevant when a market has been set up for a pollutant, or natural resource.
- Monitoring/detection, which may include both the monitoring of the environmental outcome, or the level of compliance with the regulation, tax/subsidy scheme, or private contract, as well as the development of monitoring technologies.

- Prosecution/inducement/conflict resolution costs incurred if lack of compliance is found.

Table 2.1 presents a typology of transaction costs for environmental and natural resource policies that developed by McCann et al. (2005). This table shows an indication of which process might incur the costs. Those different types of transaction costs may be incurred by different agencies and the level may also vary.

Type of transaction cost	Incurred by		
	Legislature/ courts	Agencies	Stakeholders
Research and information	+	++	+
Enactment or litigation	++	+	++
Design and implementation		++	+
Support and administration		++	+
Contracting		+	++
Monitoring/detection		++	+
Prosecution/enforcement	+	++	+

( ) Negligible transaction costs; (+) low transaction costs; (++) high transaction costs.

Table. 2.1 Typology of transaction costs associated with public policies and who incurs costs
Source::McCann et.al, 2005

Next to this, McCann et. al (2005) also developed a chronology for environmental and natural resource policies transaction costs as can be seen in Table 2.2. It explains when costs are incurred is an important question for transaction cost measurement, but another issue is when transaction costs should be measured whether those occurring before (ex-ante) and after (ex-post) the actual transaction.

By integrating literatures of transaction costs elements by Feiock (2005) and transaction costs measurement by McCann et al (2005), I develop a conceptual framework that helpful to consider the transaction costs in developing a regional landfill. To simplify the analysis, I create a transaction costs element matrix. Table 2.3 is a transaction costs element matrix that shows important aspect in identifying the transaction costs that occur in every stages of regional landfill cooperation along with measurement of the level of those costs. From this information, we can find out the significant element of transaction costs that need to be considered. Further, this would be input for policy recommendation to improve regional landfill cooperation.

Type of Cost	Baseline	Development	Early Implementation	Full Implementation	Established Program
Research and information					
Enactment or litigation					
Design and implementation					
Support and administration					
Contracting					
Monitoring and detection					
Prosecution and enforcement					
Transaction cost measurement activity:	*Ex ante* measurement	Data collection	Data collection	Data collection and preliminary *ex post* estimates	Finalized *ex post* estimates

Shaded areas indicate that the type of transaction cost is incurred during this stage.

Table 2.2. Chronology of when transaction costs occur and when they should be measured
Source::McCann et.al, 2005

Table 2.3. Conceptual Framework: Identifying transaction costs in developing regional landfill cooperation

Type of TC	Element of TC	Stage of Cooperation									
		Baseline	Level of TC +++/n.a/---	Development	Level of TC +++/n.a/---	Early Implementation	Level of TC +++/n.a/---	Full Implementation	Level of TC +++/n.a/---	Established Program	Level of TC +++/n.a/---
Ex-ante	Information Costs										
	- research and information										
	Negotiation/Divition Costs										
	- enactment or litigation										
	- contracting										
	Agency Cost										
	- support and administration										
	- design and implementation										
Ex-post	Enforcing Costs										
	- monitoring/detection										
	- prosecution and enforcement										

Shaded areas indicate that the type of transaction costs is incurred during this stage

TC = Transaction Costs
+++/--- Level of Transaction Costs
n.a Not available

Chapter 3
Research Methodology

3.1. Introduction

This chapter discusses the research methodology as the strategy to answer the research questions. As mentioned in the first chapter, the objective of this research is to understand the role of transaction costs in the phenomenon of inter-municipal-cooperation particularly in developing a regional landfill. Practically, this research intends to get some recommendation for policy makers to improve the regional landfill cooperation in Indonesia. The chapter will start with the explanation about how to conduct literature review in order to develop conceptual framework for this research. The next part of this chapter will discuss about content analysis that will be used to gain information to support the analysis. There will be also discussion about qualitative analysis using Payakumbuh Regional Landfill as a case study in order to explore the dynamic of inter-municipal cooperation. The last part of this chapter will explain the use of Q-methodology as the method that will be applied to identify perception of actors towards the transaction costs that may occur during the process to develop cooperation.

3.2. Literature Review

Levy and Ellis (2006) define literature review as sequential steps to collect, know, comprehend, apply, analyse, synthesize, and evaluate quality literature in order to provide a firm foundation to a topic and research method. In line with this, Rocco and Plathoknik (2009) say that building foundation requires previous works or studies, and provide related concept and theoretical base. Hence, conducting the literature review allows researchers to find out what is already known and what the gap between the theories. Since this research aims to understand the role of transaction costs in the phenomenon of inter-municipal-cooperation particularly in developing a regional landfill, a simultaneous literature review on theory related to municipal solid waste management, inter-municipal cooperation, and transaction costs will be valuable.

According to Onwuegbuzie, et al (2012), literature review sources should be expanded beyond pre-existing print and digital information such as research articles, dissertations,

books, the internet websites, and video. Interview or focus group discussions (FGD) are also useful and significant since they provide explanation within the research context. This research mainly uses books, articles, and document reports as the sources. All related theories will be elaborated in order to develop conceptual framework that will be used as foundation for further analysis of the research.

3.3. Case Study Method

Case study method has become a common research strategy to deal with complex social phenomena. According to Yin (2003), this method allows the researcher to gain insight many social aspects related to individual, group, organizational, social, political, and others. Furthermore, Yin (2003) categorizes case studies as explanatory, exploratory, or descriptive. This research will use descriptive approach since the research attempts to present a complete description of a phenomenon within the context (Hancock and Algozzine, 2006). Hence, the case study method is very much fit to be conducted in order to understand the role of transaction costs in the phenomenon of inter-municipal cooperation particularly in the context of regional solid waste management. Next to this, Yin (2003) recommends six sources of information that can be used including interviews, direct observations, participant observations, documentations, archival records, and physical artifacts.

This research use a single case study to confirm the relevance of transaction costs theory in the practice of inter-municipal cooperation, particularly in regional solid waste management. Yin (2003) suggests that single case study is potential to confirm the theory or to represent a unique or extreme case. Payakumbuh Regional Landfill Cooperation is chosen as the single case study. This case study can represent inter-municipal cooperation phenomena in developing a regional landfill because its typical is generally similar with other regional landfill cooperation in Indonesia.

3.4. Content Analysis

Content analysis is a method that suitable to examine concept derived from sources of information such as articles, books, newspapers, and document (Mathison, 2005). This analyses may be used either for qualitative or quantitative data (Elo and Kyngas, 2008). Content analysis can be seen as conceptual relational. Through this method, the researcher

will analyse the meaning of words or keywords and find the relation with the concept. Mathison (2005) also pointed out that content analysis can be seen as conceptual or relational analysis. Content analysis as conceptual analysis means that the researcher can analyse the concept by examining the most frequent words or phrases that appear in the text. Meanwhile, as relational analysis, content analysis can be used to analyse the relation among concept in the text.

In this research, content analysis is used in order to gain more information to support the analysis. Several data are collected, such as document plans, archive records, and online newspapers related to the case study. The result of this analysis is useful to enrich the analysis. Further, it can explain the dynamic in the process of developing the Payakumbuh Regional Landfill Cooperation.

3.5. Q-methodology

This research applies qualitative method to answer research question related to the identification of transaction costs that occur in developing regional landfill cooperation and which element of transaction costs considered as the highest one. Q-methodology will be used to fulfil this objective. Q-methodology is a combination of quantitative and qualitative method that suitable to study about actors' perception. Invented by William Stephenson in 1935, Q-methodology is developed for measuring quantitatively subjective opinions of actors that are gathered using Q-sorting technique. This method can accommodate views, perceptions, and interests of actors (Brown, 1996). In this research, the outcome of Q-methodology can investigate actors' perception towards the transaction costs that may occur during the process in developing the cooperation.

3.5.1. Concourse and Q-set Sampling

Q-set is list of statements related to the research topic that will be ranked by the respondents. Therefore, forming Q-set sampling means to select set of statements which represent the actors' perception related to the role of transaction costs in developing the Payakumbuh Regional Landfill Cooperation. The first step before forming Q-set sampling is form the "concourse". Rogers (1995) defines concourse as all related statements that may be driven from theory, research questions, interviews, documents, news, and researcher experience.

This research develop concourse mainly from the underlying theories which has been elaborated with the research questions.

The next step is to reduce concourse into simpler statements (Q-set) by excluding or combining statements that similar in meaning (Miharja, 2009). The statements are formed to cover required actors' perception as guided by conceptual framework of this research. In this case, the statements focus on actors' perception to the four elements of transaction costs i.e information cost, negotiation cost, agency cost, and monitoring cost. Statements are formed in short and straightforward sentences as simple and easy to be understood. The number of statements (Q-set) can vary from 10 to 100 items (Miharja, 2009). Based on these requirements, this research formulates 16 statements that numbered randomly. These statements represent or explain the four elements of transaction costs that occur in developing the Payakumbuh Regional Landfill Cooperation as can be seen in Table 3.1, while the statements with random number are showed in the appendix 3.

3.5.2. Respondent Selection

The next important step in Q-methodology is selecting respondents. Q-methodology needs selected respondents to provide required information. This research requires all information in developing the Payakumbuh Regional Landfill Cooperation from preparation until implementation stage. In order to achieve this, the respondents are selected by purposive sampling. Maxwell (1996) defined purposive sampling as a type of sampling in which, ''particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices''. In this research, purposeful respondents selection is chosen to get representativeness of individuals selected who involve in developing the Payakumbuh Regional Landfill Cooperation. Next to this, the respondents are expected to give their opinion and preferences about the cooperation based on their experiences.

Table 3.1. Statements for Q-set Sampling

Variable	Statement
Information Costs	1. Any effort to get information about the importance of regional landfill is high.
	2. Any effort to get information about the importance of institution for regional landfill cooperation is high.
	3. Any effort to get information about stakeholders' preferences of regional landfill is high
	4. Any effort to get information about design criteria, skill, and technology required for regional landfill is high
Negotiation Costs	5. Any effort to negotiate related to land acquisition for site location is high.
	6. Any effort to negotiate the contribution of city participants in regional landfill cooperation is high.
	7. Any effort to sign in the terms of the agreement of regional landfill cooperation is high.
	8. Any effort to establish institution of regional landfill cooperation is high.
	9. Any effort to set-up regulations for regional landfill cooperation is high.
Agency Costs	10. Any effort to do coordination with other governments is high.
	11. Any effort to convince representative and decision makers about the importance of regional landfill cooperation is high.
	12. Any effort to convince society about the importance of regional landfill cooperation is high.
	13. Any effort to gauge the political will of the constituents in regional landfill cooperation is high.
Monitoring Costs	14. Any effort for making sure that the other party sticks to the terms of the agreement in some way to ensure ongoing compliance with the terms of the agreement.
	15. Any effort in enforcing and monitoring institution in some way to ensure ongoing compliance with the terms of the agreement.
	16. Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.

Instead of estimating statistic or percentage of sample's answer, Q-methodology aims to explore the range of respondent's perception about the topic based on their personal experience (Kitzinger, 1987). Therefore, Q-methodology requires a relatively small number of respondents. Q-methodology needs selected respondents to provide required information. This regional landfill cooperation comprises three local governments, i.e. Payakumbuh Municipality, Tanah Datar Municipality, Limapuluh Kota Regency, Provincial Government, and Central Government. Each actor is represented by three respondents. As a result, this Q-methodology involves 15 respondents as can be seen in Table 3.2.

Table 3.2. List of Respondents for Q-sort

No.	Category	Institution
1.	Local Government (1)	Cleaning Agency of Payakumbuh Municipality
2	Local Government (2)	Cleaning Agency of Payakumbuh Municipality
3	Local Government (3)	Cleaning Agency of Payakumbuh Municipality
4	Local Government (4)	Public Works Agency of Bukittinggi Municipality
5	Local Government (5)	Public Works Agency of Bukittinggi Municipality
6	Local Government (6)	Public Works Agency of Bukittinggi Municipality
7	Local Government (7)	Public Works Agency of Limapuluh Kota Regency
8	Local Government (8)	Public Works Agency of Limapuluh Kota Regency
9	Local Government (9)	Public Works Agency of Limapuluh Kota Regency
10	Provincial Government (1)	UPTD (temporary set-up Institution for Regional Landfill)
11	Provincial Government (2)	UPTD (temporary set-up Institution for Regional Landfill)
12	Provincial Government (3)	UPTD (temporary set-up Institution for Regional Landfill)
13	Central Government (1)	Ministry of Public Works
14	Central Government (1)	Ministry of Public Works
15	Central Government (1)	Ministry of Public Works

3.5.3. Conducting Q-sorting

Q-sorting is the main activity in Q-methodology data collection procedure. In this step, statements related to the research topic will be ranked from level agrees to disagree (Brown, 1996). Respondents will be asked to sort and rank the statements into normal distribution of "most disagree" to "most agree". This research provides 16 statements with random number (appendix 2), During Q-sorting, respondents are asked to sort the statements to 3 piles: agree, neutral, and disagree: 6 statements for agree and 6 statements for disagree; and 4 statements as neutral. Following the principle of self-directing process (Cross, 2005), respondent are free to respond each statement based on their subjective opinion and preference related to the role of transaction costs in developing the Payakumbuh Regional Landfill Cooperation.

After that, the respondents rank 16 statements into normal distribution of "strongly disagree (-3)" to "strongly agree (+3)". The distribution is recorded on a Q-sort diagram. The diagram for Q-sort uses a symmetrical distribution about the middle, but commonly it is a flatter that a

distribution normal (Brown, 1980). However, the range and the shape of distribution can be altered and have not significant effect to the further statistical analysis (Brown, 1993). Figure 3.1 shows Q-sort diagram used in this research that range from a maximum negative value (-3) to a maximum positive value (+3)

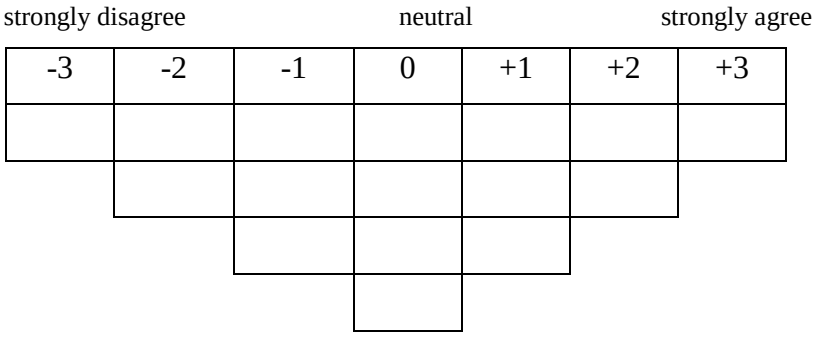

Figure 3.1. Diagram of Q-sort grid

3.5.4. Q-sort Analysis

Q-sort analysis is processed using a software PQ-method 2.35 developed by Peter Schmolck (application and manual available at http://schmolck.userweb.mwn.de/qmethod/). As mentioned by Bradley (2009), the Q-sort analysis focuses to the exploratory factor analysis, grouping the respondents based on their subjectivity, and then analysing the factors. Next to this, the Q analysis will seek for the correlation among respondents across their preference. These steps can be explained as follows:

a. Correlation and factor matrix

PQ-method produces a factor matrix in which the rows refer to the respondents and the columns show factors and its correlation. The correlation matrix table shows the extent to the respondent preferences are similar or different (Brown, 1996). Brown (1980) also states that "the factor analysis is a method to define how the respondents have classified themselves". Further, the factor analysis informs the researcher about the number of different family (factors), hence the number of factor is purely empirical and very dependent to the performing of the sort (Brown, 1993). From the correlation matrix, the researcher can selects usually 2 to 5 common factors that show the most part of the population variance (Miharja, 2009). These factors provide the actors perception dimension, that very helpful for further analysis.

b. *Naming of factors*

This step means to give name as the new identities for certain number of identified common factors (Miharja, 2009). It is important since new identities reflect the structure of respondents' subjectivity as the aim of Q-methodology. Kachigan (1991) explains that the descriptive name can represent the common element of the individual variable which has the highly load from the factors.

c. *Factor Interpretation*

The final step of the Q methodology is the interpretation stage. It can be done through qualitative explanation of the dimensional perception by using other supporting data. It is also helpful to confirm the result with related theory, previous study, and cultural knowledge in interpreting the factors (Rogers, 1995). This research collects and analyses other supporting data including document reports, archival records, and online newspaper. These data are useful to enrich the analysis because it can give evidence and help to clarify respondent's answer in Q-methodology.

Based on explanation above, Figure 3.2 illustrates the general procedure of Q-methodology.

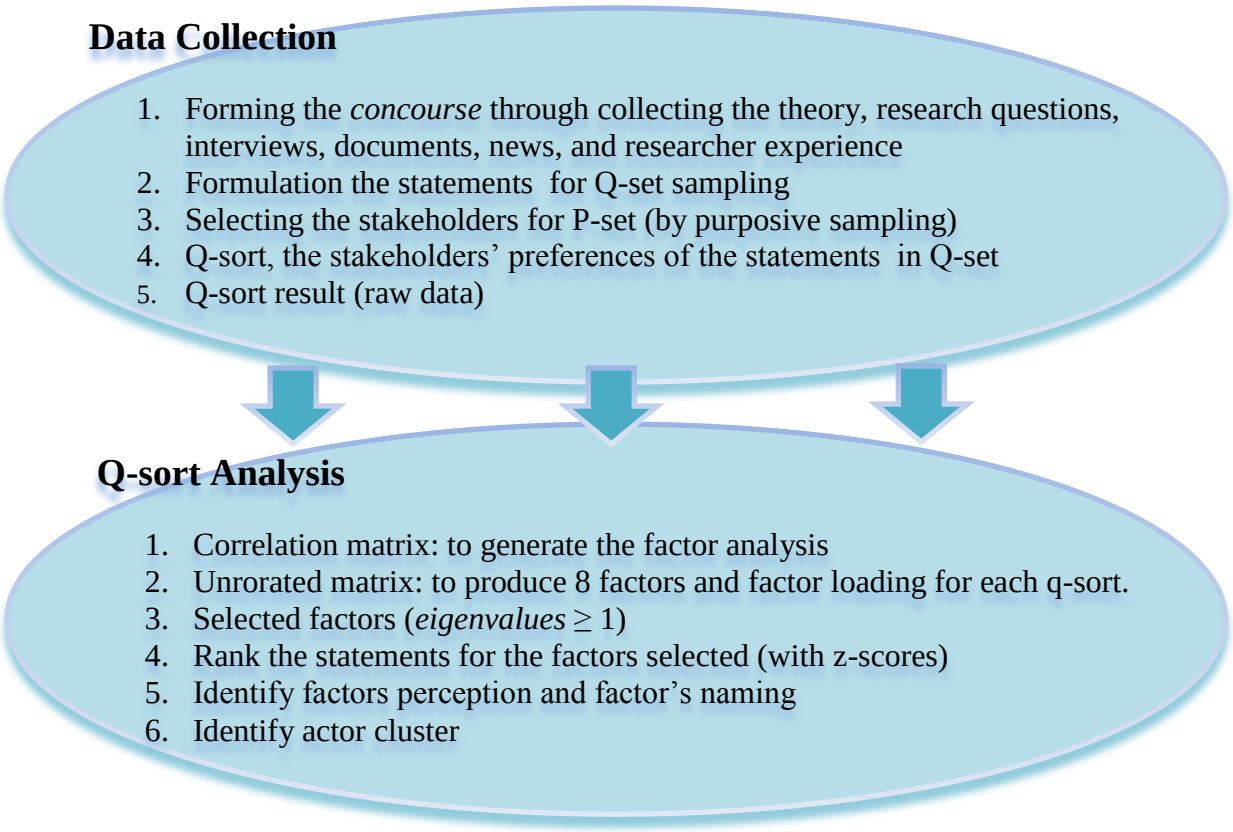

Figure 3.2. The procedure of Q-methodology

Chapter 4
Payakumbuh Regional Landfill Cooperation: a Case Study

4.1. Introduction

In the foregoing chapter, I explained the concept of transaction costs and its relationship on the level of Inter-municipal cooperation. This chapter investigates inter-municipal cooperation between three municipalities in developing the Payakumbuh Regional Landfill. It provides related information as to which local government has service agreements with other local governments. The related information, thus, becomes the basis for the study of the patterns of relationships and how these patterns help mitigate the transaction costs in developing a regional landfill.

4.2. Regional Landfill in Indonesia

After decentralisation in 1999, the responsibility for solid waste management in Indonesia is belong to the local governments. Through the Waste Management Law no.18/2008, the policy of the Ministry of Public Works encourages local governments to have a Regional Sanitary Landfill, which is jointly operated by the involved local governments. When two or more local governments agree to cooperate for the joint operation of a regional landfill, the Provincial Government shall facilitate the process and under certain conditions the Central Government will involve in providing institutional and technical guidance along with financial support. It may increase efficiency as operational costs per ton of waste treated will be lower compared to several small landfills receiving the same amount of waste. A regional landfill also may attract the private sector, especially for those who have a concern in converting the collected waste into valuable material.

In recent years, regional sanitary landfill development has been initiated in several big cities in Indonesia such as Denpasar and its surrounding cities, regencies and municipalities in Yogyakarta province, Metropolitan Bandung in West Java province, Mamminasata in South Sulawesi province, Malang Raya in East Java province, and others (IndII, 2012).

4.3. Legal Framework

Regional landfill was developed in order to settle the issues caused by the general practices of open dumping landfill system. As previously mentioned, this development was basically as the response to the Waste Management Law no.18/2008. The management of waste is conducted based on the principle of responsibility, sustainability, profitability, justice, awareness, togetherness, safety, security, and economic value (Article 3). Essentially, this Law aims to achieve the environmental-friendly waste management, by encouraging local governments, firstly to arrange a planning to stop the practice of open dumping landfill waste disposal systems at the latest one year from the enactment of the Law, and followed by the total stop of the said old system in no later than five years from the enactment of the Law (Article 44). In other words, local governments need to realize the rehabilitation of the open dumping landfill to become a controlled landfill or sanitary landfill.

Regional Landfill becomes one of strategic project as large suitable disposal sites become more difficult to find, and as the technology to manage the waste becomes more complex (IndII, 2012). As stated in Waste Management Law no.18/2008, the pattern of waste management is directed to be managed professionally by enabling the professional co-operation between/across governments through the concept of regional management of the landfill, and also the governments' cooperation with private sectors (Article 26 and 27). Further, the enactment of Law no. 32/2004 on Local Government and the Law no. 33/2004 on Fiscal Balance between the Central Government and the Local Governments, have accommodated regional management problems which require a strategy of inter-municipal cooperation. In Law no. 32/2004, it is clearly stated in Article 195 as follows "In order to improve the welfare of society, a region is able to cooperate with other regions based on efficient and effective public services consideration, synergy, and mutual profit". Article 196 also states certain conditions where inter-municipal cooperation is obligatory, that is when "conducting government's affairs which have intra-regional impact (externality)".

It should be noted that Law no. 18/2008 on Solid Waste Management is not the only law that regulates waste management in Indonesia. There are also Law no. 26/2007 on Spatial Planning and Law no. 32/2009 on Environmental Protection and Management which also have some provisions on waste management. Both of these laws contain criminal provisions which may be applicable to waste management. Moreover, the regional cooperation that is

encouraged by Law no. 18/2008 is also supported by Ministry of Public Works Regulation no. 21/PRT/M/2006 on National Policy and Strategy for the Development of Waste Management Systems.

Besides those three relatively new Laws, a series of Laws and Regulations mainly related to fiscal, financial, and authority relations between Central, Provincial and Local Government should be taken into account (IndII, 2012). These regulations are:

- Law no. 17/2003 on the State Treasury
- Law no. 7/2004 on Water Resources
- Law no. 32/2004 on Regional Government
- Law no. 33/2004 on Fiscal Balance between Central and Regional Government
- Law no. 28/2009 on Regional Tax and Retribution
- Law no. 25/2009 on Public Services
- Government Regulation no. 23/2005 on Public Services Agencies Financial Management
- Government Regulation no. 1/2008 on Government Investment
- Government Regulation no. 41/2007 on Regional Government Cooperation Procedures
- Government Regulation no. 65/2005 on Minimum Standard Services Guidelines
- Government Regulation no. 38/2007 on the allocation of Authorities between Central, Provincial and Local Government
- Ministry of Home Affairs Regulation no. 61/2007 on Regional Public Services Agency Financial Management Guidelines

4.4. Payakumbuh Regional Landfill

Payakumbuh Regional Landfill is a cooperation which consists of three municipalities in West Sumatera Province that are close to each other both geographically and administratively. Those municipalities are Payakumbuh Municipality, Bukittinggi Municipality, and Limapuluh Kota Regency. The subsequent sections will explain the implementation the cooperation. From this case, we may learn the dynamic of the inter-municipal cooperation in the context of developing a regional landfill.

4.4.1. Local Solid Waste Management Context

Payakumbuh is one of municipality in West Sumatera Province with high rate of economic growth. For a long time, this municipality has been known as one city that concern with water and sanitation issues[1]. It started in 2006 when this city was selected to participate in ISSDP (Indonesia Sanitation Sector Development Programme). Up until now, Payakumbuh has achieved MDG's (Millennium Development Goals) targets in providing water and sanitation services for its inhabitants. The successfulness in providing these basic services has become a lesson for other cities. The key success of Payakumbuh is the commitment of the Mayor himself which was supported by the local parliament and also society. The mayor of Payakumbuh, Capt. Josrizal Zain stated "*We, as the government has responsibility in providing basic needs of people, include clean water and sanitation. We have to put it as our first priority"*[2].

Having success in providing clean water and waste water services, Payakumbuh continues their commitment to overcome the issue in solid waste management. Considering the population growth that directly will generate total amount of waste, the government decided to build new landfill site with the concept of sanitary landfill. As realization, Payakumbuh prepared 8 hectares of land in Kapalo Koto Sub District as the location for landfill.

Bukittinggi on the other hand, for many years has suffered from municipal solid waste problems. Bukittinggi is the second big city in West Sumatera Province and has been popular as a tourist destination[3]. Although population of the city is not as big as in the other cities in region, the big amount of solid waste are generated from tourist activities. Every day, almost 500 m^3 of waste are generated from all over city, meanwhile the government is only capable to manage 10 m^3 per day[4].

The main problem that is faced by the government is not related to financial or human resources. Instead, finding appropriate location for landfill is extremely difficult due to geographical condition. Bukittinggi consists of plateau which makes difficulty to construct

[1] http://www.sanitasi.or.id/index.php?option=com_content&view=article&id=891:kota-payakumbuh-kota-dengan-air-minum-dan-sanitasi-terbaik-di-indonesia&catid=46:cerita-lapangan&Itemid=139
[2]http://www.academia.edu/3240230/PERCIK._Media_Informasi_Air_Mnum_dan_Penyehatan_Lingkungan._Sanitasi_Nasional._Edisi_Khusus_Tahun_2010
[3] http://en.wikipedia.org/wiki/Bukittinggi
[4] http://www.padangekspres.co.id/?news=nberita&id=2984

the landfill. Bukittinggi already has a landfill, named "Panorama" located in the city centre near tourist destination area. Having operated for many years, this landfill was no longer able to manage the waste due to over capacity. Another issue is that the practice of open dumping in this landfill has caused serious environmental problems such as pollution, odour, and health problems. During 2007, there were several rejections from the surrounding society, they protested this landfill operation, and tried to block every dump truck that enter the area of landfill[5]. In this regard, it is urgent for Bukittinggi to find a solution, otherwise solid waste problems will create bad precedent for the city as a tourist destination, which eventually may lead to the reduction of the city's revenue from tourism.

Limapuluh Kota is one of big municipalities in the West Sumatera Province since it has the largest administrative area. Compared to Bukittinggi, Limapuluh Kota is relatively does not have serious problem in solid waste management. Basically, there is no urgency for Limapuluh Kota to build new landfill. This is because this city already has a landfill that still has enough capacity to locate the waste. However, due to the wideness of its administrative area, Limapuluh Kota has an obstacle to transport the waste especially from the area that quite far from landfill location. These areas are located in the border between Limapuluh Kota Regency and Payakumbuh Municipality. Subsequently, the government has to allocate more budgets for transportation cost. Therefore, it is also important for the city to find alternative in order to manage their waste.

4.4.2. The Importance of Payakumbuh Regional Landfill

As explained in the previous section, as a response to Waste Management Law no.18/2008, central government encourages local governments to cooperate with others if they are not capable to build sanitary landfill individually. On 14 June 2007, through the facilitation from Ministry of Public Works, the authorities of six municipalities agreed to initiate a concerted effort on solid waste management. Regional landfill concept was proposed to overcome the issue of environmental degradation due to the long practice of open dumping in many areas in West Sumatera Province. Those municipalities are Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, and Agam Regency.

[5] http://news.liputan6.com/read/139849/tpa-daerah-panorama-baru-bukittinggi-diblokir-warga

This cooperation is also purposed to find the solution especially for Bukittinggi[6]. There is urgency for Bukittinggi to find new landfill site. Other municipalities also agree to cooperate since Payakumbuh Regional Landfill can be seen as long term strategy to cope with the issue of their municipal solid waste management.

4.4.3. Overview of Payakumbuh Regional Landfill Project

Location site of Payakumbuh Regional Landfill is in Kapalo Koto Sub District, in the south of Payakumbuh Municipality as shown in map (Figure 4.1). The area of land is approximately 8 hectares, including a buffer zone, waste disposal area, cover soil stockpile area, leachate processing area, recycling area, and other supporting facilities areas. This regional landfill is designed to locate 724 m^3 of waste per day[7].

Figure 4.1 Site Location

[6] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

[7] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

Payakumbuh Regional Landfill Project involves a significant number of investigation, design, training, and construction activities, with the overall objective of establishing an integrated disposal system for solid waste generated in the region through[8]:

- Constructing a Regional Landfill in Kapalo Koto Sub District, Payakumbuh
- Strengthening the operation and management system by establishing a regulatory body for Payakumbuh Regional Landfill.

Payakumbuh Regional Landfill Project was completed in three years from 2009 to 2011. This project was funded jointly by Central Government, Provincial Government, and Payakumbuh Municipality[9] with details as follows:

- Landfill, sorting and composting plants construction, heavy equipment (by Ministry of Public Works).
- Environmental Impact Assessment (EIA), sanitary landfill supporting facilities construction, land acquisition for access road construction/upgrading, operation and maintenance (by West Sumatera Province).
- Land acquisition for landfill site (by Payakumbuh Municipality).

Figure 4.2 Payakumbuh Regional Landfill Site

[8] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

[9] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

4.4.4. Setting-Up Cooperation

Setting-up cooperation will be the central issue in developing the Payakumbuh Regional Landfill. The process in building cooperation follows the guidelines provided by Ministry of Public Works as can be seen in Figure 3.3.

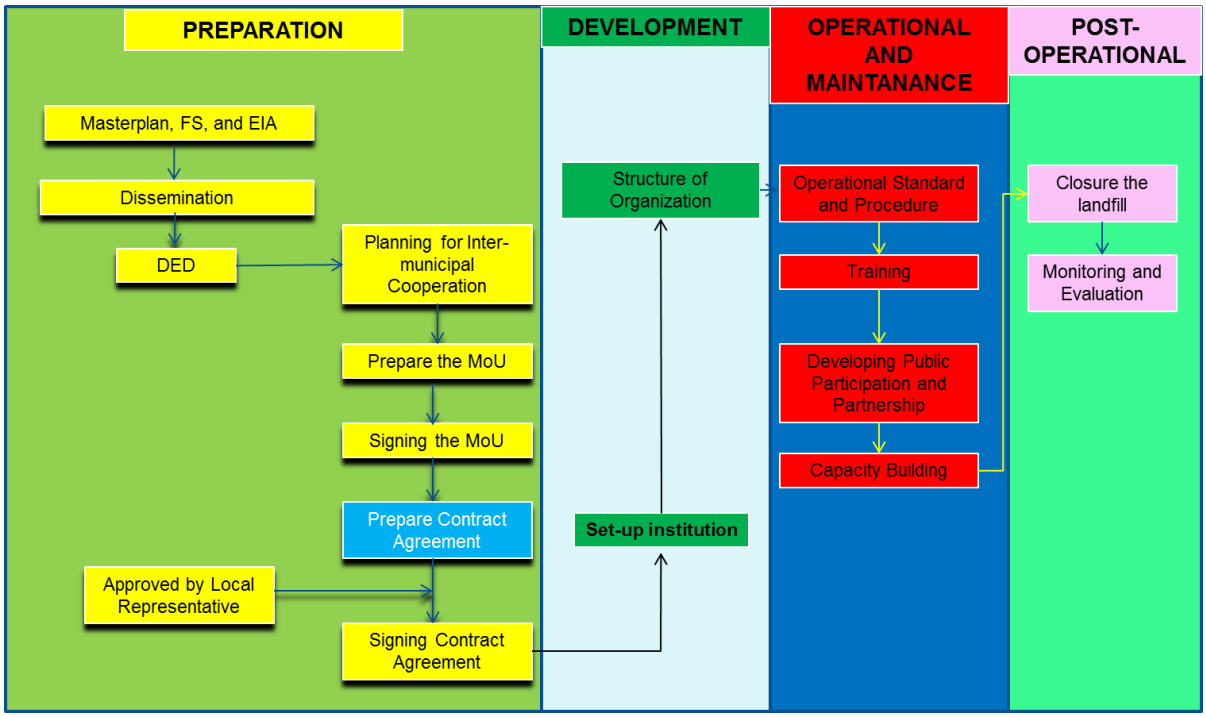

Figure. 4.3 Stages in Developing the Regional Landfill Cooperation

Source: Ministry of Public Works

Preparation

The first step in preparing cooperation was a preliminary study. Provincial Government was responsible to arrange master plan, feasibility study, and Environmental Impact Assessment (EIA). Meanwhile the socialisation and the preparation of Detailed Engineering Design (DED) were taken by Ministry of Public Works.

The next step were including the offer of cooperation plan, preparation of a collective agreement, ratification of mutual agreement, preparation of cooperation agreements, and ratification of cooperation agreement. For almost seven years (from 2007 to 2013), simultaneous meetings have been held in order to set-up cooperation. The meetings involved all related stakeholders including Central, Provincial, Local Governments, as well as the consultants. This illustrates a dynamic process in setting up cooperation. In the beginning, six municipalities agreed to cooperate, but up until now, only three municipalities that have

already signed in the agreement. For further explanation, Table 4.1 shows chronology of developing the Payakumbuh Regional Landfill Cooperation that also provides summary of minute of meetings.

Table 4.1. Chronology of Developing the Payakumbuh Regional Landfill Cooperation

Date	Stakeholders	Agenda	Outcome
14 June 2007	• Ministry of Public Works • Local Governments : Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency	Preparation to set-up regional landfill cooperation	Ministry of Public Works facilitates six municipalities for initial discussion about preparation to set-up regional landfill cooperation
7 December 2009	Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency	Memorandum of Understanding (MoU) of regional landfill cooperation	Six municipalities sign-in the MoU for regional landfill cooperation
2009 - 2011	Ministry of Public Works	Construction for Payakumbuh Regional Landfill	Payakumbuh Regional Landfill should be operated in 2012
3 October 2011	Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency	Discussion about the follow-up of the MoU	To follow-up the MoU of 7 December 2009 as soon as possible
17 October 2011	• Ministry of Public Works • Secretary of West Sumatera Province • Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency • Consultant	Follow-up meeting, discuss about: • Building the same perception about Payakumbuh Regional Landfill Cooperation • Seeking confirmation from municipalities about their participation in cooperation • Establishing a working group to concept the agreement and setting-up institution to manage the regional landfill	• In the near future the West Sumatra provincial government immediately established a Working Group (TKKSD) consisting of TKKSD from each municipality • Once the Working Group is established, there will be discussion meeting attended by representatives of each municipality
21 October 2011	• Ministry of Public Works • Secretary of West	Follow-up meeting, discuss about :	• The establishment of regional institutional UPTD

	Sumatera Province • Payakumbuh Municipality, Bukittinggi Municipality, bality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency • Consultant	• Preparation of institutional formation for Regional Landfill in West Sumatra • Preparation of a draft cooperation agreement as the follow-up of the collective agreement which has been signed previously.	to be legalised by the Governor of West Sumatra. • Availability of draft cooperation agreement
2 November 2011	• Ministry of Public Works • Secretary of West Sumatera Province • Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency • Consultant	Meeting for establishing the TKKSD	• In the near future West Sumatra provincial government has collected the names of the member of the TKKSD from each municipalities • TKKSD will prepare a draft agreement for Payakumbuh Regional Landfill cooperation
7 February 2012		The issuance of Governor Decree No. 07/ 2012 on the Establishment of UPTD Regional Landfill West Sumatra Province	It is expected that UPTD for regional landfill can start the management
18 June 2012	• Ministry of Public Works • Secretary of West Sumatera Province • Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency • Consultant	Discussion on the final draft of cooperation agreement	• Defined the amount of tipping fee • Each municipality allocates budget in the current year
11 July 2012		Cooperation agreement is submitted to be approved by local parliament (DPRD) of Province and municipalities	• Local parliament (DPRD) of Province and municipalities shall approve the agreement. • Municipalities that cooperate will allocate the budget for tipping fee in accordance with the cooperation agreement
3 August 2012		Inauguration the Head of UPTD Regional Landfill West Sumatra Province	• UPTD is expected to be operated soon • Head of UPTD Regional Landfill immediately disseminate to the public about the existence of the Regional Landfill

1 December 2012		Regional Landfill handover from the City Sanitation Agency of Payakumbuh Municipality to UPTD Regional Landfill West Sumatra Province.	Operational of regional landfill is handled by UPTD
1 January 2013		Operational of Payakumbuh Regional Landfill	UPTD starts to service municipalities
22 July 2013	• Ministry of Public Works • Secretary of West Sumatera Province • Payakumbuh Municipality, Bukittinggi Municipality, Padang Panjang Municipality, Limapuluh Kota Regency, Tanah Datar Regency, Agam Regency • Consultant	Meeting about the acceleration of Payakumbuh Regional Landfill operation	• Cooperation Agreement can be approved and followed up the signing of cooperation by each Mayor of municipality • Provide a schedule to Payakumbuh Municipality to do land acquisition for the access road to the landfill

Development

In order to operate the regional sanitary landfill, a joint waste management organisation has been developed and be prepared to take up its role with regard to management and operation against the provided mandate. The provincial government establishes a temporary body (called UPTD) whose members comprise of provincial and participating cities' staffs. The main task of this body is to prepare the regulatory framework required, management structure of the permanent body and job description of the managers (IndII, 2011). The Establishment of UPTD Regional Landfill West Sumatra Province was based on the Decree of West Sumatra Governor No. 07/ 2012. The position of UPTD is under the Highway, Spatial Planning, and Settlement Agency of West Sumatera Province. UPTD has the main task to carry out technical operational activities and technical support activities in regional landfill. Figure 3.4 shows structure organization of UPTD.

Operational and Maintenance

In this stage, UPTD has to prepare Standard Operational Procedure (SOP) in order to ensure the operation of regional landfill to fit the design criteria. Besides, it is also necessary to provide training simultaneously for staffs of UPTD and also for society. A regional landfill also may attract the private sector, or with other partners who have the idea to convert the collected waste into valuable material.

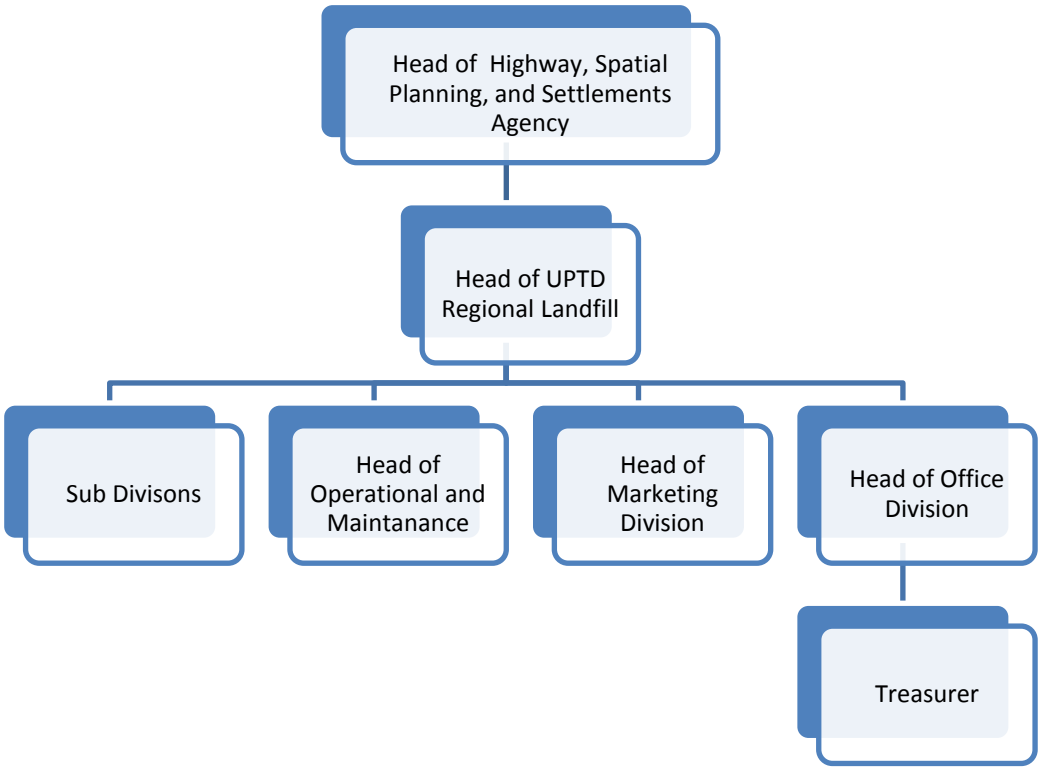

Figure 4.4 Structure Organization of UPTD Regional Landfill West Sumatera Province

Post-Operational

Post-operational stage means the closure of landfill; it is when landfill already finishes its life time (in the next 15 years). The stage includes evaluation the condition of landfill and closure the landfill. These steps should be taken based on standard criteria. The last activity will be monitoring and evaluation of environmental quality. Furthermore, post-operational stage also means the end of cooperation. Hence, all municipalities agree to finish the cooperation and will share their asset based on the term of agreement.

4.5. Shortcomings

Although UPTD has been set up in January 2013, UPTD still faces many obstacles in operating the regional landfill. Those obstacles can be explained as follow[10]:

- Up until now, cooperation agreement has not been approved by the parliament, consequently the Mayors of participating municipalities are not able sign-up the agreement yet. In order to cope with this issue, several meetings have been taken to

[10] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

discuss and find solution for this delayed. Furthermore, Provincial government in this case represented by Highway, Spatial Plan, and Settlement Agency will meet the parliament to discuss and negotiate, and further to convince them about the importance of this regional landfill cooperation. By doing so, it is expected that the parliament will approve the cooperation agreement as soon as possible.

- Payakumbuh Municipality requests the Provincial and Central Government to compensate them in lieu of the use of their land asset for the landfill and for those people surrounding the landfill that considered getting the negative impact. In order to cope with this issue, several meetings have been taken to discuss and find the win-win solution. Up until now, there is still no agreement achieved about the sort and the amount of the compensation. Instead, Provincial government is asking to review this request.
- There is still no access road to regional landfill. As the consequence, the dump trucks cannot transport the waste to the landfill area. This is mainly due to the fact that Payakumbuh Municipality is still in the process of land acquisition for the access road.
- Regional landfill has not been supported by proper equipment, especially the unavailability of recycling machine. Therefore, the budget will be proposed in the budget allocation plan in current year, 2014.

4.6. Conclusion

Based on experience in the development of several jointly-operated regional landfills, it is obvious that the challenge for success in developing cooperation lies more in the commitment of each local government than in the technical aspects. From this case study, we can see that to develop such cooperation among local government is not an easy task. In the case of solid waste management, many aspects other than technical that should be taken into consideration since the beginning of cooperation. Furthermore, the establishment of the cooperation takes longer time and also causes some delay.

In the next chapter, I will analyse the dynamic of inter-municipal cooperation in developing the Payakumbuh Regional Landfill in order to investigate the role of transaction costs that may incur during the process that is assumed as a barrier to develop cooperation.

Chapter 5
Assessing Transaction Costs
in Developing the Payakumbuh Regional Landfill

5.1. Introduction

This research aims to understand the role of transaction costs in the phenomenon of inter-municipal-cooperation particularly its impact in developing a regional landfill. Therefore, it will be useful to explain actors' perception towards transaction costs that occur during the processes. As discussed in Chapter 3, Q-methodology is used to fulfil the objective. The Q-sort data were processed by using a software PQ-method 2.35. This chapter covers related topic regarding Q-method analysis in this research. Starting with exploring the outputs of the PQ-method (Appendix-3), this chapter will discuss the result into two topics of analysis: Perception System Analysis (PS) and Actor Cluster Analysis. By the end of this chapter there will be discussion about reflection of the Q-methodology results and finally draws chapter conclusion.

5.2. Perception System Analysis

Perception System Analysis is an analysis that produces a simpler structure of actor perception by grouping actors' perception variant into small number of Perception System (PSs) (Miharja, 2009). The first step in this analysis is to explore matrix as the outputs of the PQ-method. First, correlation matrix (matrix 15x15) is a transitional matrix to generate the factor analysis. The correlation matrix is utilized to indicate the pair of the Q-sort that has been conducted. Second, un-rotated factor matrix is a matrix that includes eight factors. Each factor shows the factor loading of each Q-sort, the values that represent the correlation between each of the variables and each of the factors, as well as the eigenvalues as the representing factor from the equivalent number of variable (Kachigan, 1982). The factors that are selected for the further analysis are those that have eigenvalues ≥ 1. Based on this requirement, this analysis takes five factors (five PSs) which together explain 74% of the total actor's perception variance.

The analysis is based on Principal Component Analysis (PCA) statement factor scores (z-scores). Thus, in order to extract the perception system from those five factors, the analysis selects several significant statements from each factor which have either positive or negative z-scores. The score indicates each statement contribution to the content of PS whether the actors agree (z-scores = positive) or disagree (z-scores = negative) with the statements. The combination of these significant statements will generate the new factor meaning. The next step is to give name as perception system (PS) as the new identity.

PS1: *Concluding the agreement*

This PS is composed by four significant statements that construct specific perception about the difficulties in concluding the agreement for cooperation. This perception is supported by the strongest statement (statement 16, z-scores = 1.691). It is said that the process to sign in the term of agreement of Payakumbuh Regional Landfill is considerably as the highest transaction cost.

Table 5.1 The four statements with the most significant scores in PS1

No.	Statements	z-scores
16	Any effort to sign in the terms of the agreement of regional landfill cooperation is high.	1.691
13	Any effort to do coordination with other governments is high.	-1.459
7	Any effort to set-up regulations for regional landfill cooperation is high	-1.436
15	Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.	1.415

On the other hand, this PS is also supported by actors' disagreement with statement (13) "Any effort to do coordination with other governments is high" (z-score = -1.459) as the next significant statement. It means that the issue of the difficulties for local governments to coordinate with either provincial or central government is not relevant for this perception system. In other words, with this perception system, it can be said that coordination is not considered as high transaction cost in developing the Payakumbuh Regional Landfill. Similarly, this PS also disagrees with statement (7) "Any effort to set-up regulations for regional landfill cooperation is high" as another significant statement. According to this negative score, legal aspect, in this case the process to set-up regulations also does not contribute high transaction costs.

Although this PS is composed by four significant statements, only one statement about the difficulties to conclude the agreement is strongly contribute high transaction costs in developing the Payakumbuh Regional Landfill. Meanwhile, the other two statements which regard to the issue about negotiation process and legal aspects reflect actor's disagreement to consider these two processes as high transaction costs.

Besides, there is also enforcement or monitoring costs is considerably as high transaction cost is reflected by statement (15) "All effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement" (z-scores = 1.415). However, this statement is not really relevant with this PS.

PS2: *Socialization to the local people*

This PS is supported by five significant statements. Three of significant statements reflect the actor's perception considering socialization about the importance of regional landfill cooperation along with the negotiation in acquiring the land could take many efforts. From statement (9) "Any effort to convince society about the importance of regional landfill cooperation is high" (z-scores = 1.399), it is shown that the government find the difficulties in convincing society to understand the importance of regional landfill. Another significant statement is statement (12) "Any effort to negotiate related to land acquisition for site location is high" (z-scores = 1.001). It is clear that land is a high value asset. It is not easy to negotiate with the land owner regarding the compensation as their land will become the location of landfill.

Table 5.2 The five statements with the most significant scores in PS2

No.	Statements	z-scores
13	Any effort to do coordination with other governments is high.	2.098
4	Any effort to negotiate the contribution of city participants in regional landfill cooperation is high.	-1.796
9	Any effort to convince society about the importance of regional landfill cooperation is high.	1.399
8	Any effort to get information about stakeholders' preferences of regional landfill is high.	-1.303
12	Any effort to negotiate related to land acquisition for site location is high.	1.001

However, from two other significant statements, it is clear that there is less effort to negotiate with local governments related their contribution in this cooperation. It is supported by sufficient information about the actor's preferences in the beginning of cooperation. Statement (4) "Any effort to negotiate the contribution of city participants in regional landfill cooperation is high" (z-score = -1.796) and statement (8) "Any effort to get information about stakeholders' preferences of regional landfill is high" (z-score = -1.303) could explain disagreement of actors to consider these two aspect as high transaction costs.

Another significant statement is statement (2) "Any effort to do coordination with other governments is high" (z-scores = 2.098). Although this statement reflects actors' strong agreement regarding high transaction costs in coordination, this statement is not really relevant with this PS

PS 3: ***Land development process***

This PS constructs specific system perception related to land development process. There are three significant statements that form this perception. First, statement (12) "Any effort to negotiate related to land acquisition for site location is high" (z-score = 1.431). Second, statement (11) "Any effort to convince representative and decision makers about the importance of regional landfill cooperation is high" (z-score = 1.344). Third, statement (9) "Any effort to convince society about the importance of regional landfill cooperation is high" (z-score = 1.008). These statements emphasize that asset and land acquisition becomes the important issue in developing the regional landfill. This issue begins with land acquisition from local people until transfer of ownership. It is clear that this process is difficult and takes much effort. The problems are caused because the stakeholders are not clearly understood about the importance and benefits of the regional landfill.

There are also other significant statements in PS3. However these statements do not support this PS unique belief. The actors agree to consider enforcing and monitoring operational of regional landfill as low transaction cost. This perception is supported by statement (15) "Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement" (z-score = -1.254). On the other hand, the actors agree that transaction costs would be higher when they are seeking for information about stakeholder's preferences towards the regional landfill. This perceptions is reflected by

statement (8) “Any effort to get information about stakeholders’ preferences of regional landfill is high” (z-score = 1.385).

Table 5.3 The five statements with the most significant scores in PS3

No.	Statements	z-scores
15	Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.	-1.883
12	Any effort to negotiate related to land acquisition for site location is high.	1.431
8	Any effort to get information about stakeholders’ preferences of regional landfill is high	1.385
11	Any effort to convince representative and decision makers about the importance of regional landfill cooperation is high.	1.344
9	Any effort to convince society about the importance of regional landfill cooperation is high.	1.008

PS 4: ***Information about the importance of regional landfill***

PS4 constructs perception of actors related to high transaction cost in getting information about the importance of the Payakumbuh Regional Landfill. This perception can be seen from the statement (3) “Any effort to get information about the importance of regional landfill is high” (z-score = 2.012). In the meantime, the understanding about the importance and benefits of cooperation is one of preconditions for the actors to establish the institution for the cooperation. Therefore, lack of information consequently leads to the difficulty of the actors in establishing institution. This perception is reflected by statement (2) “Any effort to establish institution of regional landfill cooperation is high” (z-score = 1.273).

Table 5.4 The four statements with the most significant scores in PS4

No.	Statements	z-scores
3	Any effort to get information about the importance of regional landfill is high.	2.012
2	Any effort to establish institution of regional landfill cooperation is high	1.273
15	Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.	-1.254
4	Any effort to negotiate the contribution of city participants in regional landfill cooperation is high.	-1.246

Other two lower scored statements do not support this PS. There is disagreement of actors to consider enforcing and monitoring operational of regional landfill as high transaction cost. This perception is supported by statement (15) "Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement" (z-score = -1.254). Also, the actors disagree with statement (4) "Any effort to negotiate the contribution of city participants in regional landfill cooperation is high" (z-score = -1.246). It means that negotiation process is considered to contribute low transaction costs.

PS 5: ***Monitoring and enforcement the agreement***

This PS5 constructs perception of actors related the issue in monitoring and enforcement the agreement. There are two significant statements that contribute in this PS. Those are statement (10) "Any effort for making sure that the other party sticks to the terms of the agreement in some way to ensure ongoing compliance with the terms of the agreement" (z-score = 2.245) and statement (15) "Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement" (z-score = 1.177). Both of statements emphasize that there is high transaction cost for enforcing and monitoring regional landfill cooperation.

Table 5.5 The four statements with the most significant scores in PS5

No.	Statements	z-scores
10	Any effort for making sure that the other party sticks to the terms of the agreement in some way to ensure ongoing compliance with the terms of the agreement.	2.245
9	Any effort to convince society about the importance of regional landfill cooperation is high.	1.497
1	Any effort to gauge the political will of the constituents in regional landfill cooperation is high.	-1.286
15	Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.	1.177

Other two lower scored statements are not in the same belief with the other highest statements. The actors agree that convince society about the importance of regional landfill is need much effort as can be seen in statement (9) "Any effort to convince society about the importance of regional landfill cooperation is high" (z-score = 1.497). Hence, this agreement

is a shared belief with PS2 and PS3. Besides, there is disagreement of actors about the difficulty in recognizing any political will of the constituents in each municipality regarding landfill cooperation. This perception is supported by statement (1) "Any effort to gauge the political will of the constituents in regional landfill cooperation is high." (z-score = - 1.286)

5.3. Actor cluster analysis

Actor Cluster Analysis is an analysis that aims to investigate the relationship between particular actor categories with particular Perception System (PSs) (Miharja, 2009). The analysis is based on Principal Component Analysis (PCA) factor loadings.

As mentioned in section 5.1, five factors are selected for the analysis. These factors are rotated using the Varimax rotated matrix in order to obtain factor loading (see Appendix 3). Next, PCA factor loadings can identify actors with significant contribution to particular PS. Actor category that will be used for analysis should be based on the criteria in which factor loading > 0.6 0r < - 0.6 as mentioned by Kachigan (1991) in Miharja (2009). Table 5.6 presents the category of actors with loading values > 0.6. The value of loading represents correlation between PS and actors' category. The higher the loading value means the bigger correlation among actors and the perception system.

Table 5.6 Significant actors in the five PSs

PS	Actor Category	Loading
PS1	Provincial Government (1)	0.83
	Local Government (1)	0.82
	Local Government (9)	0.82
PS2	Central Government (2)	0.85
	Local Government (8)	0.80
PS3	Central Government (3)	0.82
	Local Government (4)	0.69
PS4	Provincial Government (2)	0.79
	Local Government (3)	0.65
PS5	Provincial Government (3)	0.81
	Central Government (1)	0.75
	Local Government (7)	0.61

Table 5.6 shows some patterns of relationship between particular actor category and a unique perception system. Provincial and two local governments are significant actors within PS1 and PS4. Next, PS2 and PS3 show similar pattern in which both PSs are formed by actors from central and local government. Meanwhile, PS5 is the most heterogenic one since it is formed by combination among provincial, central, and local government.

The result of actor cluster analysis can be discussed in several perspectives. Firstly, provincial and local government has unique perception in PS1 and PS4. It can be explained that those actors are related to the process of concluding the agreement and searching for the information about the importance of regional landfill. This can be understood since provincial and local governments are the actors that involve in cooperation and they have to sign-in the agreement. In practice, there are a lot of uncertainties inhibit this process in which cause the delay. Moreover, those actors have less knowledge and information about the practice of regional landfill cooperation and they found it difficult in gaining this specific information. Secondly, PS2 and PS3 reflect the strong perception of actors from central and local government regarding the issue of giving socialization to local people and land development process. This follows the logic that although Payakumbuh regional is the cooperation between municipalities, in practice, preparation process including finding appropriate land, land acquisition, and convince the society are not only the responsibility of local government but also are the domain of central government. The last perspective is the heterogenic perception in PS5 that formed by central, provincial, and local governments. It represents the fact that monitoring and enforcing the implementation compliances with the term of agreement are the responsibility of all actors.

Overall, it can be seen that central and provincial government are the dominant actors that found transaction costs as the barrier in cooperation. It can be understood if we look at to the process of the cooperation. Payakumbuh regional landfill was not the product of local governments' planning, but the development initially comes from central government agenda. As a result, local governments to be the passive actors while other higher level of governments need much effort to play the role as facilitator.

5.4. Q-methodology Result Reflection

Based on analysis, it is found that concluding the agreement; socialization to the local people; land development process; information about the importance of regional landfill; and monitoring and enforcement the agreement contribute significantly to actor's perception towards elements of transaction costs in developing the Payakumbuh Regional Landfill. This section will cover the discussion and reflection of this finding. Through this discussion, I will provide set of arguments for understanding the role of transaction costs in the phenomenon of inter-municipal-cooperation and its particular impact on regional landfill. This discussion also uses supporting data for further clarification.

Concluding the agreement

This perception is supported by actors from provincial and local government. It shows that these actors have common perception; they agree that the process of sign in the agreement is very difficult and takes much effort. Cooperation agreement has not been approved by the local parliaments, as the result the Mayor of each municipality cannot sign-up the agreement yet. In the beginning, six municipalities agreed to cooperate, but up until now, only three municipalities that have already signed in the agreement. It can be explained since Payakumbuh Regional Landfill is a cooperation that consists of many municipalities. Although there are no issues about negotiation process and legal aspect, there might be many conflicts of interest among actors that generate transaction costs. One of the reasons that cause the delay is because cooperation agreement has not been approved by the parliament.[1]
As argued by DiNapoli (2009) that shared services often take longer to organize than an individual municipal program simply because there are more stakeholders involved.

Socialization to the local people

As we know, compare with other issue, solid waste management gets less attention by society. There is a thought of people said that solid waste is only government's responsibility. It might be true that as a public service, local government must responsible in providing better solid waste management for the citizens. For those actors from central and local government, it is hard to convince the society about the importance of regional landfill. This

[1] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

perception is closely related to the awareness and knowledge of society about solid waste management. Furthermore, lack of awareness of society can also triggers another issue about land acquisition. In this case, Payakumbuh as the host of landfill site faces potential conflict related to sitting landfill site within its jurisdiction (Zhu et al, 2008). Payakumbuh needs longer time to negotiate with the landowner just because their family thought that living near landfill will give bad impact to their daily life. However, in my opinion it is very important to give socialization to society about the important of regional landfill in the very beginning. In this case, I argue that information not only related to the landfill itself but also about solid waste management in general that should be shared continuously. Several activities such as training and sanitation campaign can be a viable solution.

Land development process

Land development process is crucial elements in developing regional landfill. Specific requirement in finding appropriate location for landfill site as well as high technology and skilled human resources make a landfill to be considered has high asset specificity. As a result there will be many conflicts during the process. Long negotiation between the land owner and the government is required to get the equilibrium price. During the preparation process, the government found the difficulty in acquiring and purchasing the land. In the next development process, as mentioned in the Chapter 4, UPTD still faced many difficulties to operate the Payakumbuh Regional Landfill. One of the problems is because there was still no access road to the landfill. This due to Payakumbuh Municipality takes a long time in acquiring the land. In this case, it also clear that land acquiring takes longer time because of difficulties in negotiation with the land owner. The process was finally done in the mid of 2014 or almost three years from the beginning of site construction phase.[2] On the next two months, provincial government through Highway, Spatial Planning, and Settlement Agency will start two build 2 Km access road. This perception is also triggered by the fact that there is lack of information about the importance of regional landfill. It means that the government should socialize the project to the local people before the implementation. This process still continue to the process of transfer the property right from Payakumbuh Municipality to UPTD as the institution for this cooperation. Payakumbuh Municipality requests the Provincial and Central Government to compensate them in lieu of the use of their land asset

[2] http://www.antarasumbar.com/berita/payakumbuh/d/4/349838/ganti-kerugian-jalan-tpa-regional-payakumbuh-tuntas.html

for the landfill and for those people surrounding the landfill that considered getting the negative impact.[3]

Information about the Importance of regional landfill

As already mentioned, information about the importance of regional landfill should be informed from the early beginning. This information is valuable for the success of cooperation and the operationalization of the landfill. Not all actors understand about what sanitary landfill is and how the system works. In this case, actor from central government already has such information. The specific characteristic of information contributes to high transaction cost in which provincial and local governments agree that they need much effort to gain sufficient information. This situation in line with what have been said by Alexander, 2001a; Slangen et al, 2008; and Coggan et al, 2010; 2013 as 'asymmetric information' which means that there are lack of sufficient and limited resources of information. I propose solution for overcoming this issue, central government as facilitator should give socialization and also training all stakeholders involved beside provides them with guidelines and set of regulations.

The asymmetric information also triggers the difficulty in establishing institution for Payakumbuh Regional Landfill. From simultaneously meeting, it can be seen that institution establishment took long time until UPTD was finally established in August 2012 and started to operate in January 2013[4]. Central government through Ministry of Public Works had encouraged provincial and local government for preparing UPTD by providing guidelines and sets of regulations. Nevertheless, local governments tended to be persuasive and just wait for the action of other higher level of government. As a result, provincial takes the responsibility. Unfortunately, provincial government also found that this is not their domain, provincial also wait initiative of local governments. In this case, we can see "opportunism" as one of the sources of transaction costs. As explained by Slangen et al (2008), "opportunism' arises when the strategic effort is introduced and complicates the mutual objective achievement. In this situation, some actors behave differently from what they appear to be doing.

[3] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

[4] http://www.antarasumbar.com/berita/payakumbuh/d/4/262233/uptd-pengelolaan-sampah-beroperasi-awal-2013.html

Monitoring and enforcement the agreement

In planning, monitoring and enforcing are the two elements that are needed in measuring the success of the implementation. This process involves all actors from central, provincial, and local government. However, monitoring and enforcing the agreement could be the costly process due to a lot of uncertainties as argued by Coggan et al (2010; 2013). Firstly, much effort is required for making sure that the other party sticks to the terms of the agreement. As stated by Miharja (2009), there is no guarantee that other local government will comply with the agreement. In regard to this, in my point of view, mutual trust and credibility are needed amongst parties in order to reduce uncertainties. Since this cooperation is built on mutual trust and credibility, in the long term these relationship lower transaction cost (Shrestra, 2005). Secondly, enforcing cost also occur in some way to ensure operationalization of regional landfill compliances with the terms of the agreement. The reason of this is because characteristic of landfill itself that needs high costs, high technology, and skilled human resources to operate the landfill. This is in line with the argument of Alexander (2001a) and Coggan et al (2010; 2013) in term of asset specificity as one of characteristics of transactions that influence transaction costs. Another reason is also because provincial government cannot locate more budgets for operationalization since the asset of landfill is still belong to Payakumbuh Municipality. As already mentioned, up until now, the process of transfer property right has not reached any agreement yet.[5]

5.5. Transaction Costs Identification

Besides identifying actors' perception towards transaction costs, based on the result of Q-methodology, we can also identify the elements of transaction costs that occur during the process of cooperation. Similarly with Perception System Analysis, the level of transaction costs whether it is high or low is identified from z-scores of each statement. Using the conceptual framework developed in Chapter 2, I identify the level of transaction cost as can be seen in Table 5.7.

The information of the importance of regional landfill is become precondition to develop such a cooperation. In this preparation stage, the actors consider that the process in gaining

[5] TPA Regional Payakumbuh, Presentation of Head of Highway, Spatial Planning, and Settlement Agency, 2013

perfect information will be difficult due to asymmetric information. Further issue that is faced by the government is related to the effort in convincing the society that contributes high agency cost.

During the development stage, there are three processes that contribute to the significant negotiation and agency costs. First, negotiation for acquiring the landfill was time consumed; there is imperfect information between the buyer and seller. Due to the uncertainty, the seller, in this case the landowner preserves the land value by maximizing the price. On the other hand, local government as the buyer tends to keep the information about the future potential of the land. This situation illustrates that there is "opportunistic behaviour" in this transaction in which the transactors share distorted information to other (Slangen et al, 2008). Second, opportunism is also reflected in the process of establishing institution for cooperation as the result of asymmetric information. The last process is to sign-in the agreement. As previously mentioned, there might be many conflicts of interest among actors involved in the cooperation, thus, generate transaction costs. One of the reasons that causes the delay is because cooperation agreement has not been approved by the parliaments. It can be explained since the parliaments do not have broader knowledge about regional landfill cooperation, and it is hard to convince them due to their bounded rationality.

Enforcement cost relatively occurs during the implementation stage. Transaction costs are incurred during the process for making sure the operationalization of the regional landfill and the way that the other party sticks to the terms of the agreement. Again, asymmetric information, asset specificity, and uncertainties become the sources of these costs.

Table 5.7 Transaction costs that occur in developing Payakumbuh Regional Landfill Cooperation

Type of TC	Element of TC	Stage of Cooperation									
		Baseline	Level of TC	Development	Level of TC	Early Implementation	Level of TC	Full Implementation	Level of TC	Established Program	Level of TC
			+++/n.a/---		+++/n.a/---		+++/n.a/---		+++/n.a/---		+++/n.a/---
Ex-ante	Information Costs										
	- research and information	the importance of regional landfill	+++	the importance of institution for regional landfill cooperation	n.a	design criteria, skill, and technology required	n.a				
				stakeholders' preferences	---						
	Negotiation/Divition Costs										
	- enactment or litigation			negotiate related to land acquisition	+++						
				establish institution	+++						
				set-up regulations	---						
	- contracting			sign in the terms of the agreement	+++						
				negotiate the contribution of city participants	---						
	Agency Cost										
	- support and administration	coordination with other governments	+++	coordination with other governments	---	coordination with other governments	---	coordination with other governments	---	coordination with other governments	n.a
		convince society	+++	convince representative and decision makers	+++						
				gauge the political will of the constituents	---						
	- design and implementation										
Ex-post	Enforcing Costs										
	- monitoring/detection							monitoring institution	n.a	monitoring institution	n.a
								monitoring regional landfill operation	+++	monitoring regional landfill operation	n.a
	- prosecution and enforcement							other party sticks to the terms of the agreement	+++	other party sticks to the terms of the agreement	n.a

TC = Transaction Costs
+++/--- Level of Transaction Costs
n.a Not available

5.6. Payakumbuh Regional Landfill Unique Characteristic

In the foregoing section, it has been explained that Perception System Analysis generates five perception systems (PS) of actors towards transaction costs during the process in developing the Payakumbuh Regional Landfill. Interestingly, these perception systems are much related to the issue of land development and property right which reflect Payakumbuh Regional Landfill unique characteristic. This finding is based on relatively consistent high z-scores of statement (9) and (12) in almost all perception systems. These two statements reflect the transaction costs during land development process. Table 5.8 shows those high z-scores as well as the rank of each statement in the five PSs. From this table, it can be seen that these statements give strong contribution in actors perceived transaction costs in developing Payakumbuh Regional Landfill.

Table 5.8 Z-scores and ranks of statements related to land development process

Statements	PS1		PS2		PS3		PS4		PS5	
	z	rank	z	rank	z	rank	z	rank	z	rank
Any effort to convince society about the importance of regional landfill cooperation is high. (9)	0.971	4	1.399	2	1.008	4	-0.892	12	1.497	2
Any effort to negotiate related to land acquisition for site location is high. (12)	0.717	6	1.001	3	1.431	1	0.938	3	-0.748	13

The above result confirms this research assumption that issue related land asset exists and influences more significantly in actors' perception towards transaction costs in developing the Payakumbuh Regional Landfill. This also confirms the assumption that there is a unique characteristic of transaction cost elements in Payakumbuh Regional Landfill case compare with other practices of inter-municipal cooperation. For example, Miharja (2009) in his research about Bandung Metropolitan Area (BMA) transport planning collaboration found that embedded governance cultural constraint, socio-economic, and political aspects are more important elements of actor's perceived transaction costs. However, this finding should not be interpreted that those factors are not exist in Payakumbuh Regional Landfill case. Rather, from this result, we can argue that characteristic of transaction costs depends on characteristics of the good or service in exchange itself (Carr et al, 2007). In Payakumbuh Regional Landfill, land as a

valuable asset is the object of transaction, consequently land development process become crucial element of the transaction.

5.7. Conclusion

Q-methodology has been applied in order to identify actors' perception towards transaction costs in developing the Payakumbuh Regional Landfill Cooperation. The Q-method output has been analysed in two aspects. Firstly, through Perception System Analysis, it is found that there are five perception systems (PSs) that represent the structure of actors' perception that useful for further identification and explanation about actors' perception towards transaction costs that occur during the process in developing the Payakumbuh Regional Landfill Cooperation. The five perception systems are concluding the agreement; socialization to the local people; land development process; information about the importance of regional landfill; monitoring and enforcement the agreement. From these perception systems, it can be seen that three elements of transaction costs i.e information cost, negotiation cost, agency cost are much higher during preparation and development stage of cooperation. Meanwhile, enforcement cost relatively occurs during the implementation stage. Another interesting finding is these perception systems are much related to the issue of land development and property right which reflect Payakumbuh Regional Landfill unique characteristic.

Secondly, actor cluster analysis has identified the relationship between particular actor categories and one unique perception system. Provincial and local government constructs a solid perception system in PS1 "concluding the agreement" and PS4 "information about the importance of regional landfill". Provincial and local governments perceive that concluding the agreement is difficult and takes much effort. They also agree that information about the importance of regional landfill is limited. PS2 and PS3 show similar pattern in which both perception systems are supported by actors from central and local government. These actors agree that socialization about the importance of regional landfill cooperation and land development are the two processes that contribute high transaction cost. Meanwhile, PS5 is supported by the most heterogenic actors' category since provincial, central, and local government share common perception about the difficulty in monitoring and enforcing the cooperation agreement of Payakumbuh Regional Landfill.

Chapter 6
Conclusion and Recommendation

6.1. Conclusion

This research is focused on the role of transaction costs in the phenomenon of inter-municipal cooperation in the context of regional solid waste management. Regional landfill is an option to address the challenge of local governments in providing better landfill system. Further, regional landfill cooperation can be seen as an inter-municipal cooperation in solid waste management when two or more local governments agree to cooperate in developing a sanitary landfill. Through regionalization, local government expect to reduce or avoid costs, improve service delivery, or maintain services. However, there are transaction costs incurred during the processes of information searches required to make decisions, along with those of negotiating, monitoring, and enforcing agreements that potential to become a barrier in developing such cooperation.

Specific transaction costs characteristics at the level of service in developing regional landfill are not investigated in the prior studies of inter-municipal cooperation. The knowledge of the specific transaction risks and their level that should be considered by all stakeholders involved will be very valuable for the theory and practice in the field. Therefore, using Payakumbuh Regional landfill as a case study, this research intends to assess the role of transaction costs in this cooperation.

Q-methodology has been applied in order to identify actors' perception towards transaction costs. The result of Q-methodology leads to a number of conclusions. First, there are five actor's perception systems, i.e. concluding the agreement; socialization to the local people; land development process; information about the importance of regional landfill; monitoring and enforcement the agreement, as factors that generate high transaction costs during the processes. Second, transaction costs are experienced various across time due to uncertainties, asymmetric information, and opportunistic behaviour of the actors. Three elements of transaction costs i.e information cost, negotiation cost, agency cost are much higher during preparation and development stage of cooperation. Meanwhile, enforcement cost relatively occurs during the implementation stage. Interestingly, these perception systems are much related to the issue of land development and property right which in turn reflect Payakumbuh

Regional Landfill unique characteristic. Compare to other type of inter-municipal cooperation that are mostly influenced by financial, socio-cultural, and political aspects, in regional landfill cooperation the issue related land development and property right get more attention. This is because characteristic of landfill itself that needs high costs, high technology, and skilled human resources to operate the landfill that potential to generate high transaction costs.

Finally, this research has sought the answer for the main research question "*To what extent the role of transaction costs in developing a regional landfill cooperation?"* From this research, it can be conclude that typically for regional landfill cooperation, the actors involved should consider the crucial element related land development and property right as the potential barrier that can cause delays in developing the cooperation.

6.2. Recommendation

The previous conclusion provides consideration to answer research question by dealing with actors' perception related to level of transaction costs in developing Payakumbuh Regional Landfill Cooperation. Better understanding about the role of transaction costs is useful to improve the practice of this type of cooperation as an appropriate option for urban areas in dealing with solid waste management. Next to this, considering about the unique characteristic of transaction costs that might occur during the process in setting-up regional landfill cooperation, several practical recommendations shall be introduced.

The first important consideration for policy recommendation is based on the fact that there was lack of information about the importance of regional landfill. Information provision in preparation stage may reduce transaction costs experienced on going implementation in the future. Hence, the importance of regional solid waste should be informed in the beginning of the process. Not only the society and governments need the information but also politician and those who act as decision makers. In the long term, more systematic development concept is recommended to build integrated solid waste management information system. Several programs such as regular training or sanitation campaign for parliament members as well as other actors are recommended to advance their understanding about the importance of solid waste management including developing a sanitary landfill.

Secondly, instead of voluntary agreement, Payakumbuh Regional Landfill cooperation initially was a central government agenda. Under this top-down planning process, the strong role of central government is still helpful in giving financial and technical assistants in establishing cooperation. However, this system has led to the passive behaviour of local governments. They tend to be less proactive and just follow the agenda of central government. As can be seen in the finding of this research, central and provincial government are the dominant actors that found transaction costs as the barrier in cooperation. Therefore, in my point of view, the cooperation should be a voluntary agreement, instead of being forced by central regulation. This is because the local governments themselves that will get benefits of cooperation. Then, it is expected that they become more proactive in the cooperation, not just rely on provincial or central government. Negotiation, coordination, and sharing information amongst city participants will be much easier. In other word, it may also reduce transaction costs.

The last important policy recommendation is related the issue of land development and transfer property right contributes the highest transaction costs. I argue that it is important for the actors to get an agreement about this issue in the beginning of the process. There should be perfect information between the buyer and seller of the land to achieve the best land price. Besides that, the procedure to transfer the property right from the municipality who owns the asset to the provincial government should also be clear on the agreement. The delays of this process will inhibit the next stages of cooperation. Considering the property transfer is not an easy task, there is also a need for government to create such appropriate forms of governance in order to respond the transaction's characteristic associated with land development and property right. This form of governance is expected enable to provide perfect and reliable information that will reduce uncertainties of the processes involving in land development control, thus will lower transaction costs.

6.3. Further Research

Transaction cost theory is very relevant to explain the dynamic process in developing inter-municipal cooperation. In particular context of regional landfill, where it involves local governments, provincial government, and central government, transaction costs explanation is applicable to address complex interaction amongst the actors.

This research tries to capture the practice of inter-municipal cooperation particularly in developing a regional landfill. However this research revealed a number of weaknesses in understanding the role of transaction cost in the specific context of regional landfill. Not only because there are limited literature and data on the case study, there are also very few analysis in identify transaction costs that are incurred. As a consequence, the result of this research is still narrow and just provides basic explanation. In this case, the use of Q-methodology is relevant for this study; however it would be better if the analysis should be added with deep interview of the respondent in order to gain further explanation and the reason behind their perceptions towards transaction costs.

From this research, we can also conclude that it is necessary to include transaction cost measurement in the evaluation of cost-benefit analysis of the proposed policy. This research does not cover the way to measure the costs; instead this research provides several backgrounds that will be useful for the input for further study. Therefore, further study is desirable to understand and develop conceptual framework for measuring transaction cost in developing a regional landfill. Next to this, integration of transaction cost theory and theory of land development is also open for further research. More detail explanation about the process of land development in developing a regional landfill including land acquisition/assembly, financing, land preparation/development, land disposition, construction, and property transfer will be valuable in measuring transaction costs. Finally, theory of institutional design is applicable in order to develop a conceptual framework to create such appropriate forms of governance to control this land development process.

List of References

Alexander, E.R. 2001a. A transaction-cost theory of land use planning and development control: Towards the institutional analysis of public planning. *Town Planning Review* 72: 45-75

Alexander, E.R. 2001b. Governance and transaction costs in planning systems: a conceptual framework for institutional analysis of land-use planning and development control the case of Israel. Environment and Planning: Planning and Design 2001, volume 28, pages 755 - 776

Bish, R, L. 1971. The Public Economy of Metropolitan Areas. Markham Publishing Company.Chicago.

Blaeschke, F. 2014. What drives small municipalities to cooperate? Evidence from Hessian municipalities. Joint Discussion Paper Series in Economic. Universities of Aachen · Gießen · Göttingen · Kassel · Marburg · Siegen

Bradley, J., 2009. Q Methodology. Combining the best of qualitative and quantitative techniques. Nottinghamshire: Nottingham University .

Brown, S. R., 1996. Q Methodology and Qualitative Research. Qualitative Health Research, 1996 (November), 6 (4),, 6(4), pp. 561-567.

Brown, S. R., 1980. Political Subjectivity. Application of Q Methodology in Political Science. I ed. New Haven and London: Yale University Press.

Brown, S. R., 1993. A Primer on Q Methodology. Operant Subjectivity, 16 ((3/4)), pp. 91-138.

Brown, T.L., Potoski, M. 2003. Transaction Costs and Institutional Explanations for Government Service Production Decisions. Journal of Public Administration Research and Theory 13(4): 441-468.

Buitelaar, E. 2004. A transaction cost analysis of the land development process. Urban Studies Vol. 41, No. 13, 2539-2553

Council of Europe. 2008. Intermunicipal Co-operation. Manual of the European Committee on Local and Regional Democracy (CDLR)

Carr, J.B., LeRoux, K., Feiock, R., Shrestha, M. 2007. Trust, Transaction Costs, and Service Production Decisions: An Institutional Collective Action Explanation. Prepared for the 9th National Public Management Research Conference, Tucson, Arizona. October 25-27th, 2007.

Coggan, A., Whitten, S.M., Bennett,J., 2010. Influences of transaction costs in environmental policy. Ecological Economics 69, 1777–1784

Coggan, A., Buitelaar, E., Whitten, S.M., Bennett,J., 2013. Factors that influence transaction costs in development offsets: Who bears what and why? Ecological Economics 88, 222-231

Cross, R., 2005. Exploring Attitudes: the case for Q methodology. Health Education Research. Teory and Practice, 20(2), p. 206–213.

Damanhuri, E. 2008. A Future Prospect of Municipal Solid Waste Management in Indonesia. Keynote Lecture to the 5th Asian-Pacific Landfill Symposium in Sapporo, Japan, October 22(Wed)-24(Fri), 2008.

DiNapoli, P, T. 2009. Shared Services in Local Government. New York

Elo, S., Kyngas, H. 2008. The qualitative content analysis process. Journal of Advanced Nursing 62(1), 107–115

Feiock, R. C. 2004. Metropolitan Governance: Conflict, Competition, and Cooperation, Washington D.C.: Georgetown University Press.

Feiock, R. C. 2005. Institutional Collective Action and Local Governance. Paper presented at The Innovative Governance Salon, University of Southern California, April 25 2005

Feiock, R. C. 2007. Rational Choice and Regional Governance. Journal of Urban Affairs 29, 1 (Winter): 49-65

Gallagher, K.G,. 1994. Exploring the Economic Advantages of Regional Landfills. SOLID WASTE TECHNOLOGIES / SEPTEMBER / OCTOBER 1994

Government of NewFoundland and Labradar, Department of Environment. 2002. Waste Management Strategy.

Hancook, R.D., Algozzine, B. 2006. Doing Case Study Research. A Practical Guide for Beginner Researchers. NewYork: Teachers College Press.

Hirshfeld, S., Vesilind, P.A., Pas, E.I. 1992. Assessing the true cost of landfills. Waste Managament & Research 10. 471-484

Hulst, R., Montfront, A. 2007. Inter-municipal Cooperation in Europe. Dordrecht: Springer

IndII, 2011. Technical Report "Scoping Study For Solid Waste Management in Indonesia"

IndII, 2012. Final Design Report "Detailed Engineering Design for Mamminasata RSWDS"

Kachigan, S., 1982. Multivariate Statictical Analysis. New York: Radius Press
.

Kardono., Purwanta, W. 2007. Landfill Gas for Energy: Its Status and Prospect in Indonesia. Proceedings of International Symposium on Eco Topia Science 2007, ISETSO7.

Kitzinger, C. 1987. The social construction of Lesbianism. Sage: Bristol

Krueger, S, McGuire, M. 2005. A Transaction Costs Explanation of Interlocal Government Collaboration. Working Group on Interlocal Services Cooperation.Paper 21

Levyy,Y., Ellis,T.J. 2006. A Systems Approach to Conduct an Effective Literature Review in Support of Information Systems Research. Informing Science Journal. Volume 9

Louis, H.G.L., Laura, A.L., Arjen, H.L.S. 2008. Institutional economics and economic organization theory. An integrated approach. Wageningen Academic Publisher. The Netherlands.

Mathison, S. 2005. Encyclopedia of Evaluation Content Analysis. SAGE Publications

Maxwell, J.A. 1996. Qualitative Research Design: An Interactive Approach. Applied Social Research Methods Series, Vol. 41. Sage: London

McCann,L.,Colby,B.,Easter,K.W.,Kasterine,A.,Kuperan,K.V.,2005. Transaction costs measurement for evaluating environmental policies. Ecological Economics 52, 527-542

Meidiana, C. 2010. Development of Waste Management Practices in Indonesia. European Journal of Scientific Research. ISSN 1450-216X Vol.40 No.2 pp.199-210.

Miharja, M. 2009. Inter Local Government Collaboration in Indonesia Metropolitan Transport Planning, Groningen: University of Groningen.

Ministry of Urban Development. Government of India. Guidance Note. Municipal Solid Waste Management on a Regional Basis

Municipal Capacity Development Program (MCDP) .2010. A Guide to Municipal Cooperation: Succeeding in Regional Partnerships

Onwuegbuzie, A.J., Leech, N.L., Collins, K.M.T. 2012. Qualitative Analysis Techniques for the Review of the Literature. The Qualitative Report Volume 17, Article 56, 1-28

Rocco,T.S., Plakhotnik,M.S. 2009. Literature Reviews, Conceptual Frameworks, and Theoretical Frameworks: Terms, Functions, and Distinctions. Human Resource Development Review 8: 120

Rogers, S.R,. 1995. Q Methodology. In Smith, J,A., Haree,R. and Van Longenhove, I. (eds), Rethinking Methods in Psychology. Sage: London, pp 178-193

Sahu, K, A, n.y. Regional Approach-Municipal Solid Waste Management". D-Waste

Schübeler, P. 1996. Conceptual Framework for Municipal Solid Waste Management in Low-Income Countries, UNDP/UNCHS (Habitat)/World Bank/SDC Collaborative Programme on Municipal Solid Waste management in Low-Income Countries

Shrestha, M. K. 2005. Inter-Local Fiscal Cooperation in the Provision of Local Public Services – The Case of Large US Cities. Paper presented at the annual meeting of the American Society for Public Administration, Milwaukee, Wisconsin, April 2-5, 2005.

Shrestha, M. K. 2008. Decentralized Governments, Networks and Interlocal Cooperation in Public Goods Supply. Electronic Theses, Treatises and Dissertations. Paper 324.

Tchobanoglous, G., & Kreith, F. 1993. Handbook of Solid Waste Management. McGraw-Hill Professional.

UNDP. 2006. Inter-municipal Cooperation in Planning and Service Delivery: Analysis and Recommendations

USEPA, 1994. Joining Forces on Solid Waste Management Regionalization Is Working in Rural and Small Communities

Wukich, R.C. 2011. Working Together: Exploring the Factors that Influence Interorganizational Cooperation. University of Pittsburgh

Yin, R. K. 2003.Case Study Research. Design and Methods (Third Edition). California: Sage Inc.

Zerbock, O. 2003. Urban Solid Waste Management: Waste Reduction in Developing Nations. Written for the Requirements of CE 5993.

Zhu, D., Asnani, P.U., Zurbrugg, C., Anapolsky, S., Mani, S. 2008. Improving Municipal Solid Waste in India. A Sourcebook for Policy Makers and Practitioners. Washington, D.C: The World Bank

Appendix 1a. Letter for Q-sorting participation (English Version)

Date : 26 May 2014
Subject : Q-sorting
Attachment : Q-sorting protocol

Dear Sir/Madame,

My name is Indri Kurnia, a student in Environmental Infrastructure Planning Programme at the Faculty of Spatial Sciences – University of Groningen, the Netherlands, I am now working on my Master Thesis. The research topic is "Assessing Transaction Cost in Inter-municipal Cooperation, Case Study: Developing Payakumbuh Regional Landfill". The research objective is to understand the role of transaction costs in the phenomenon of inter-municipal-cooperation and its particular impact on regional landfill cooperation.

As part of data collecting process, I would like to ask your institution to appoint one representative to be the respondent in Q-methodology. I would really appreciate if the respondent has solid waste management planning background or task. The information from the Q-methodology will be valuable for my research and may provide inputs to improve Regional Landfill Cooperation in Indonesia.

The respondent answer will be treated confidentially. If you ask me to do so, I will not mention respondent name in the future publication. Respondent answer and identity will be known only by me and my supervisor. If you have any further question, you may contact me (indri.kurnia@yahoo.co.id; phone +6281263490222 or my colleague Vikri Febriyanto (vic_gerrard@yahoo.co.id; phone +6285641759245).

Thank you for your kind cooperation.

Kind Regards,
Indri Kurnia

Appendix 1b. Letter for Q-sorting participation (Indonesian Version)

Tanggal : 26 Mei 2014
Perihal : Responden untuk Q-sorting
Lampiran : Protokol Q-sorting

Yth. Bapak/Ibu,

Nama saya Indri Kurnia, staf Satker Pengembangan Penyehatan Lingkungan Permukiman Sumatera Barat, DJCK, Kemen PU. Saat ini saya sedang menyususn tesis di Environmental Infrastructure Planning Master Programme , Faculty of Spatial Sciences – University of Groningen, the Netherlands. Topik riset saya adalah "Biaya Transaksi dalam Pengembangan Kerjasama Antar Daerah, Studi Kasus: TPA (Tempat Pemrosesan Akhir) Regional Payakumbuh". Tujuan dari riset ini adalah untuk memahami peran biaya transaksi dalam kerjasama antar daerah, khususnya pada kerjasama TPA regional.

Sebagai bagian dari pengumpulan data dalam riset ini, saya bermaksud mengajukan permohonan pada institusi Bapak/Ibu pimpin untuk menunjuk tiga orang responden untuk Q-sorting. Saya sangat berterima kasih bila responden yang ditunjuk terlibat dalam proses kerjasama TPA Regional Payakumbuh. Informasi akan sangat berharga untuk riset saya dan diharapkan memberikan masukan pada peningkatan kerjasama antar daerah, khususnya pada kerjasama TPA Regional.

Informasi dari responden akan dijaga kerahasiaannya. Jika diminta, saya tidak akan menyebut identitas responden dari riset ini. Jawaban responden hanya akan diketahui oleh saya dan dosen pembimbing. Apabila Bapak/Ibu memiliki pertanyaan lebih lanjut, silakan menghubungi saya (indri.kurnia@yahoo.co.id; telp 081363490222), atau rekan saya Vikri Febriyanto (vic_gerrard@yahoo.co.id; telp 085641759245).

Terima kasih atas perhatian dan kerjasama dari Bapak/Ibu.

Wassalam,
Indri Kurnia

Appendix 2a. Q-sorting Protocol (English version)

Riset : Assessing Transaction Cost in Inter-municipal Cooperation, Case Study Developing Payakumbuh Regional Landfill Project

Periset : Indri Kurnia
Master student, Environmental Infrastructure Planning Programme, Faculty of Spatial Sciences, University of Groningen, the Netherlands

Date : …….
Respondent : …….
Institution : …….

Thank you for participating.

Step-1
Read the four statements simultaneously. Give your preferences on the relative importance of each statement in the context of Payakumbuh Regional Landfill Cooperation.

Step-2
Allocate each of 16 statements to one of the three preferences category (agree, neutral, disagree), by writing the statement's number in the each of box of Form-A.

I.	Disagree	: 6 statements
II.	Neutral	: 4 statements
III.	Agree	: 6 statements
	Total	: 16 statements

Form-A:
Preferences Category

I.	Disagree						
II.	Neutral						
III.	Agree						

Step-3
Allocate each of 6 statements of the preference category I (Disagree) to each of the box of Form-B according to your preferences scale (from -3 = strongly disagree to -1 = disagree).

Form-B

strongly disagree — disagree

-3	-2	-1

Langkah-4
Allocate each of 6 statements of the preference category I (Agree) to each of the box of Form-B according to your preferences scale (from 1 = agree to 3 = strongly agree).

Form-B

agree strongly agree

1	2	3

Important notes:

- The rest of statements (4 statements) belong to the preference category II (Neutral)
- During the Q-sorting, the respondents may change the position of the statement numbers until he/she satisfies with the last distribution.

16 statements for Q-sorting :

1. Any effort to gauge the political will of the constituents in regional landfill cooperation is high.
2. Any effort to establish institution of regional landfill cooperation is high
3. Any effort to get information about the importance of regional landfill is high.
4. Any effort to negotiate the contribution of city participants in regional landfill cooperation is high.
5. Any effort in enforcing and monitoring institution in some way to ensure ongoing compliance with the terms of the agreement.
6. Any effort to get information about design criteria, skill, and technology required for regional landfill is high
7. Any effort to set-up regulations for regional landfill cooperation is high.
8. Any effort to get information about stakeholders' preferences of regional landfill is high
9. Any effort to convince society about the importance of regional landfill cooperation is high.
10. Any effort for making sure that the other party sticks to the terms of the agreement in some way to ensure ongoing compliance with the terms of the agreement.
11. Any effort to convince representative and decision makers about the importance of regional landfill cooperation is high.
12. Any effort to negotiate related to land acquisition for site location is high.
13. Any effort to negotiate the contribution of city participants in regional landfill cooperation is high..
14. Any effort to get information about the importance of institution for regional landfill cooperation is high
15. Any effort in enforcing and monitoring regional landfill operation in some way to ensure ongoing compliance with the terms of the agreement.
16. Any effort to sign in the terms of the agreement of regional landfill cooperation is high.

Appendix 2b. Q-sorting Protocol (Indonesian version)

Riset : Biaya Transaksi dalam Kerjasama Antar Daerah, Studi Kasus : TPA Regional, Payakumbuh, Indonesia

Periset : Indri Kurnia
Master student, Environmental Infrastructure Planning Programme, Faculty of Spatial Sciences, University of Groningen, the Netherlands

Tanggal : …….
Responden : …….
Institusi : …….

Terima kasih atas partisipasi Saudara dalam Q-sorting ini. Identitas dan jawaban responden akan dijaga kerahasiannya.

Langkah-1
Bacalah keseluruhan dari 16 pernyataan secara simultan. Berikan preferensi Saudara terhadap tingkat kepentingan relatif dari masing-masing pernyataan dalam konteks kerjasama TPA Regional Payakumbuh.

Langkah-2
Alokasikan masing-masing dari 16 pernyataan pada satu dari 3 kategori preferensi (setuju, netral, tidak setuju), dengan cara mengisikan tiap nomor pernyataan pada masing-masing kotak yang tersedia pada Form-A.

IV. Tidak setuju : 6 pernyataan
V. Netral : 4 pernyataan
VI. Setuju : 6 pernyataan
Total : 16 pernyataan

Form-A:
Kategori Preferensi

IV.	Tidak setuju						
V.	Netral						
VI.	Setuju						

Langkah-3
Alokasikan masing-masing dari 6 pernyataan pada kategori preferensi I (tidak setuju) ke setiap kotak pada Form-B sesuai dengan skala preferensi Saudara (-3 = sangat tidak setuju, hingga -1 = tidak setuju)

Form-B

Sangat Tdk setuju tdk setuju

-3	-2	-1

Langkah-4

Alokasikan masing-masing dari 6 pernyataan pada kategori preferensi III (setuju) ke setiap kotak pada Form-C sesuai dengan skala preferensi Saudara (1 = setuju, hingga 3 = sangat setuju)

Form-B

setuju sangat setuju

1	2	3

Catatan penting:

- Sisa pernyataan (4 pernyataan) dimasukkan ke kelompok preferensi II (Netral)
- Selama Q-sorting, responden dipersilakan untuk mengubah-ubah posisi nomor pernyataan hingga mencapai distribusi yang memuaskan

16 Pernyataan untuk Q-sorting:

1. Biaya, waktu, dan usaha yang dibutuhkan untuk mengukur kepentingan politik kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
2. Biaya, waktu, dan usaha yang dibutuhkan untuk pembentukan kelembagaan (unit organisasi) yang menangani kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
3. Biaya, waktu, dan usaha yang dibutuhkan untuk mendapatkan informasi tentang perlunya keberadaan TPA Regional Payakumbuh adalah terlalu tinggi.
4. Biaya, waktu, dan usaha yang dibutuhkan untuk melakukan negosiasi tentang kontribusi (hak dan kewajiban) masing-masing kota dalam kerjasama TPA Regional Payakumbuh adalah terlalu tinggi
5. Biaya, waktu, dan usaha yang dibutuhkan untuk pengawasan kelembagaan TPA Regional Payakumbuh sesuai dengan kesepakatan bersama adalah terlalu tinggi.
6. Biaya, waktu, dan usaha yang dibutuhkan untuk mendapatkan informasi tentang kriteria pembangunan, desain, teknologi, dan operasional TPA Regional Payakumbuh adalah terlalu tinggi.
7. Biaya, waktu, dan usaha yang dibutuhkan untuk penyusunan perangkat peraturan (Perda, dll) terkait kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
8. Biaya, waktu, dan usaha yang dibutuhkan untuk mendapatkan informasi tentang keinginan pihak-pihak terkait terhadap TPA Regional Payakumbuh adalah terlalu tinggi.
9. Biaya, waktu, dan usaha yang dibutuhkan untuk meyakinkan masyarakat tentang pentingnya kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
10. Biaya, waktu, dan usaha yang dibutuhkan untuk memastikan masing-masing pihak mengikuti aturan sesuai kesepakatan bersama kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
11. Biaya, waktu, dan usaha yang dibutuhkan untuk meyakinkan DPRD atau pihak pengambil keputusan tentang pentingnya kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
12. Biaya, waktu, dan usaha yang dibutuhkan untuk melakukan negosiasi terkait pembebasan lahan untuk TPA Regional Payakumbuh adalah terlalu tinggi.
13. Biaya, waktu, dan usaha yang dibutuhkan untuk melakukan koordinasi dengan pihak propinsi atau pihak pusat terkait kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.
14. Biaya, waktu, dan usaha yang dibutuhkan untuk mendapatkan informasi tentang pentingnya kelembagaan TPA Regional Payakumbuh adalah terlalu tinggi.
15. Biaya, waktu, dan usaha yang dibutuhkan untuk pengawasan operasional TPA Regional Payakumbuh sesuai dengan kesepakatan bersama adalah terlalu tinggi.
16. Biaya, waktu, dan usaha yang dibutuhkan untuk proses penandatanganan kesepakatan bersama kerjasama TPA Regional Payakumbuh adalah terlalu tinggi.

Appendix 3. Selected PQ-method ouputs

PQMethod2.35 Payakumbuh Regional Landfill
Path and Project Name: D:\Desktop\PQMethod\projects/PYK3

Correlation Matrix Between Sorts

SORTS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	PYKLH1	100	12	-5	-10	8	12	32	3	65	43	-32	8	3	20	-8
2	PYKLH2	12	100	-37	-22	-20	-12	-15	12	15	10	17	-10	12	15	-40
3	PYKLH3	-5	-37	100	15	22	-35	15	-28	0	5	43	17	-3	-12	28
4	BKTPU1	-10	-22	15	100	-40	15	28	25	-28	-15	3	-15	12	35	62
5	BKTPU2	8	-20	22	-40	100	-10	30	-30	45	17	3	37	35	-28	-15
6	BKTPU3	12	-12	-35	15	-10	100	12	-25	32	5	-40	30	35	-8	-25
7	LPKPU1	32	-15	15	28	30	12	100	15	40	57	-10	45	45	43	8
8	LPKPU2	3	12	-28	25	-30	-25	15	100	-28	10	15	-5	-12	52	12
9	LPKPU3	65	15	0	-28	45	32	40	-28	100	70	-20	32	25	-17	-30
10	UPTD1	43	10	5	-15	17	5	57	10	70	100	3	17	0	-3	-37
11	UPTD2	-32	17	43	3	3	-40	-10	15	-20	3	100	5	-10	5	3
12	UPTD3	8	-10	17	-15	37	30	45	-5	32	17	5	100	32	28	-30
13	SATKER1	3	12	-3	12	35	35	45	-12	25	0	-10	32	100	-3	-5
14	SATKER2	20	15	-12	35	-28	-8	43	52	-17	-3	5	28	-3	100	22
15	SATKER3	-8	-40	28	62	-15	-25	8	12	-30	-37	3	-30	-5	22	100

Unrotated Factor Matrix

	Factors 1	2	3	4	5	6	7	8
SORTS								
1 PYKLH1	0.5550	0.2324	-0.2810	0.0703	-0.5357	0.0382	-0.1566	0.3724
2 PYKLH2	0.0948	-0.1884	-0.6138	0.3850	0.2759	0.4974	-0.0685	0.2333
3 PYKLH3	-0.0390	0.1159	0.8184	0.2845	-0.1497	0.0688	0.2202	0.2458
4 BKTPU1	-0.3692	0.7174	0.0948	-0.3116	-0.0665	0.2964	0.2510	-0.0531
5 BKTPU2	0.5594	-0.1828	0.5403	0.1100	0.1236	-0.0679	-0.4621	-0.1503
6 BKTPU3	0.4067	0.0449	-0.2195	-0.7163	0.1823	-0.0395	0.4097	0.0287
7 LPKPU1	0.5683	0.7134	0.1577	0.0714	0.0338	0.0232	-0.0419	-0.1935
8 LPKPU2	-0.2716	0.5199	-0.4345	0.3721	0.0950	-0.1752	-0.1242	-0.3504
9 LPKPU3	0.8889	-0.0279	-0.0255	0.0514	-0.2880	0.1665	0.0516	0.0741
10 UPTD1	0.6722	0.1603	-0.1100	0.4035	-0.3183	0.0427	0.3149	-0.3475
11 UPTD2	-0.2612	-0.0050	0.3139	0.6681	0.3123	0.2286	0.3150	0.0379
12 UPTD3	0.5565	0.2397	0.2197	0.0474	0.5213	-0.4123	0.1186	0.2489
13 SATKER1	0.4411	0.2181	0.1534	-0.3201	0.5092	0.4883	-0.2338	-0.0919
14 SATKER2	-0.1006	0.7559	-0.3185	0.2072	0.1998	-0.2228	-0.1185	0.3129
15 SATKER3	-0.5112	0.5083	0.3578	-0.2035	-0.3147	0.1727	-0.2477	0.0792
Eigenvalues	3.4157	2.3934	2.1006	1.8008	1.4004	0.9486	0.8845	0.7423
% expl.Var.	23	16	14	12	9	6	6	5

PQMethod2.35 Payakumbuh Regional Landfill
Path and Project Name: D:\Desktop\PQMethod\projects/PYK3

Cumulative Communalities Matrix

	Factors 1 Thru 1	2	3	4	5	6	7	8
SORTS								
1 PYKLH1	0.3080	0.3620	0.4410	0.4459	0.7329	0.7344	0.7589	0.8976
2 PYKLH2	0.0090	0.0445	0.4212	0.5694	0.6455	0.8929	0.8976	0.9521
3 PYKLH3	0.0015	0.0150	0.6847	0.7656	0.7880	0.7927	0.8412	0.9016
4 BKTPU1	0.1363	0.6509	0.6599	0.7570	0.7614	0.8493	0.9123	0.9151
5 BKTPU2	0.3130	0.3463	0.6382	0.6503	0.6656	0.6702	0.8838	0.9064
6 BKTPU3	0.1654	0.1674	0.2156	0.7287	0.7619	0.7635	0.9313	0.9321
7 LPKPU1	0.3229	0.8319	0.8568	0.8619	0.8630	0.8635	0.8653	0.9027
8 LPKPU2	0.0738	0.3440	0.5328	0.6713	0.6803	0.7110	0.7264	0.8492
9 LPKPU3	0.7901	0.7909	0.7915	0.7942	0.8771	0.9048	0.9075	0.9129
10 UPTD1	0.4519	0.4776	0.4897	0.6525	0.7538	0.7556	0.8548	0.9755
11 UPTD2	0.0682	0.0682	0.1668	0.6132	0.7107	0.7629	0.8621	0.8636
12 UPTD3	0.3097	0.3671	0.4154	0.4176	0.6894	0.8594	0.8734	0.9354
13 SATKER1	0.1946	0.2422	0.2657	0.3682	0.6275	0.8659	0.9206	0.9291
14 SATKER2	0.0101	0.5815	0.6829	0.7259	0.7658	0.8154	0.8295	0.9274
15 SATKER3	0.2613	0.5196	0.6476	0.6891	0.7881	0.8180	0.8793	0.8856
cum% expl.Var.	23	39	53	65	74	80	86	91

Factor Matrix with an X Indicating a Defining Sort

	Loadings 1	2	3	4	5
QSORT					
1 PYKLH1	0.8153X	0.0929	-0.0014	-0.2280	-0.0871
2 PYKLH2	0.0328	0.3118	-0.7364X	0.0100	-0.0698
3 PYKLH3	0.0798	-0.2930	0.4984	0.6521X	0.1488
4 BKTPU1	-0.1547	0.4854	0.6902X	-0.1529	0.0458
5 BKTPU2	0.2594	-0.5211	-0.0254	0.2704	0.5030
6 BKTPU3	0.0196	-0.1109	-0.0103	-0.7773X	0.3807
7 LPKPU1	0.5564	0.3154	0.2921	0.0261	0.6065
8 LPKPU2	0.0190	0.8012X	-0.0716	0.1420	-0.1126
9 LPKPU3	0.8164X	-0.2843	-0.1737	-0.1588	0.2727
10 UPTD1	0.8290X	0.0432	-0.1832	0.1301	0.1192
11 UPTD2	-0.2199	0.1290	-0.1252	0.7888X	0.0881
12 UPTD3	0.1383	0.0185	-0.1087	0.0762	0.8076X
13 SATKER1	-0.0370	-0.0285	0.0152	-0.2431	0.7523X
14 SATKER2	0.0771	0.8445X	0.1015	0.0349	0.1873
15 SATKER3	-0.1569	0.2118	0.8207X	0.0850	-0.1947
% expl.Var.	17	15	14	13	15

PQMethod2.35 Payakumbuh Regional Landfill
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Free Distribution Data Results

QSORT		MEAN	ST.DEV.
1	PYKLH1	0.000	1.633
2	PYKLH2	0.000	1.633
3	PYKLH3	0.000	1.633
4	BKTPU1	0.000	1.633
5	BKTPU2	0.000	1.633
6	BKTPU3	0.000	1.633
7	LPKPU1	0.000	1.633
8	LPKPU2	0.000	1.633
9	LPKPU3	0.000	1.633
10	UPTD1	0.000	1.633
11	UPTD2	0.000	1.633
12	UPTD3	0.000	1.633
13	SATKER1	0.000	1.633
14	SATKER2	0.000	1.633
15	SATKER3	0.000	1.633

Factor Scores with Corresponding Ranks

No.	Statement	Factors									
		No.	1		2		3		4		5	
1	Sta_01	1	-0.25	9	0.00	8	-0.68	12	-1.13	14	-1.29	16
2	Sta_02	2	-0.47	10	-0.30	10	-0.93	14	1.27	2	-0.53	11
3	Sta_03	3	-0.70	12	0.30	6	-0.95	15	2.01	1	-0.11	7
4	Sta_04	4	0.93	5	-1.80	16	-0.54	10	-1.25	15	0.64	5
5	Sta_05	5	-0.68	11	-0.79	14	-0.67	11	-1.10	13	0.00	6
6	Sta_06	6	0.97	4	0.40	5	-0.04	9	-0.00	9	-1.18	15
7	Sta_07	7	-1.44	15	-0.49	11	0.72	5	0.46	5	-0.86	14
8	Sta_08	8	-0.97	14	-1.30	15	1.39	2	-0.42	10	-0.32	9
9	Sta_09	9	0.97	4	1.40	2	1.01	4	-0.89	12	1.50	2
10	Sta_10	10	-0.72	13	0.79	4	0.09	7	0.32	8	2.25	1
11	Sta_11	11	0.00	7	-0.60	12	1.34	3	0.45	6	-0.43	10
12	Sta_12	12	0.72	6	1.00	3	1.43	1	0.94	3	-0.75	13
13	Sta_13	13	-1.46	16	2.10	1	0.58	6	-0.68	11	-0.64	12
14	Sta_14	14	-0.02	8	-0.70	13	0.04	8	0.83	4	0.75	4
15	Sta_15	15	1.42	2	0.10	7	-1.88	16	-1.25	16	1.18	3
16	Sta_16	16	1.69	1	-0.10	9	-0.91	13	0.44	7	-0.21	8

PQMethod2.35 Payakumbuh Regional Landfill
Path and Project Name: D:\Desktop\PQMethod\projects/PYK3

Correlations Between Factor Scores

	1	2	3	4	5
1	1.0000	-0.0275	-0.2875	-0.1903	0.2119
2	-0.0275	1.0000	0.1671	0.0776	0.0670
3	-0.2875	0.1671	1.0000	0.0997	-0.1465
4	-0.1903	0.0776	0.0997	1.0000	-0.1689
5	0.2119	0.0670	-0.1465	-0.1689	1.0000

Factor Scores -- For Factor 1

No.	Statement	No.	Z-SCORES
16	Sta_16	16	1.691
15	Sta_15	15	1.415
6	Sta_06	6	0.971
9	Sta_09	9	0.971
4	Sta_04	4	0.931
12	Sta_12	12	0.717
11	Sta_11	11	0.000
14	Sta_14	14	-0.019
1	Sta_01	1	-0.253
2	Sta_02	2	-0.465
5	Sta_05	5	-0.676
3	Sta_03	3	-0.699
10	Sta_10	10	-0.717
8	Sta_08	8	-0.971
7	Sta_07	7	-1.436
13	Sta_13	13	-1.459

PQMethod2.35 Payakumbuh Regional Landfill
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Factor Scores -- For Factor 2

No.	Statement	No.	Z-SCORES
13	Sta_13	13	2.098
9	Sta_09	9	1.399
12	Sta_12	12	1.001
10	Sta_10	10	0.795
6	Sta_06	6	0.397
3	Sta_03	3	0.302
15	Sta_15	15	0.095
1	Sta_01	1	0.000
16	Sta_16	16	-0.095
2	Sta_02	2	-0.302
7	Sta_07	7	-0.493
11	Sta_11	11	-0.604
14	Sta_14	14	-0.699
5	Sta_05	5	-0.795
8	Sta_08	8	-1.303
4	Sta_04	4	-1.796

Factor Scores -- For Factor 3

No.	Statement	No.	Z-SCORES
12	Sta_12	12	1.431
8	Sta_08	8	1.385
11	Sta_11	11	1.344
9	Sta_09	9	1.008
7	Sta_07	7	0.724
13	Sta_13	13	0.580
10	Sta_10	10	0.086
14	Sta_14	14	0.041
6	Sta_06	6	-0.041
4	Sta_04	4	-0.539
5	Sta_05	5	-0.666
1	Sta_01	1	-0.678
16	Sta_16	16	-0.909
2	Sta_02	2	-0.933
3	Sta_03	3	-0.950
15	Sta_15	15	-1.883

PQMethod2.35 Payakumbuh Regional Landfill
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Factor Scores -- For Factor 4

No.	Statement	No.	Z-SCORES
3	Sta_03	3	2.012
2	Sta_02	2	1.273
12	Sta_12	12	0.938
14	Sta_14	14	0.831
7	Sta_07	7	0.461
11	Sta_11	11	0.450
16	Sta_16	16	0.442
10	Sta_10	10	0.316
6	Sta_06	6	-0.000
8	Sta_08	8	-0.423
13	Sta_13	13	-0.679
9	Sta_09	9	-0.892
5	Sta_05	5	-1.101
1	Sta_01	1	-1.129
4	Sta_04	4	-1.246
15	Sta_15	15	-1.254

Factor Scores -- For Factor 5

No.	Statement	No.	Z-SCORES
10	Sta_10	10	2.245
9	Sta_09	9	1.497
15	Sta_15	15	1.177
14	Sta_14	14	0.748
4	Sta_04	4	0.640
5	Sta_05	5	0.000
3	Sta_03	3	-0.109
16	Sta_16	16	-0.211
8	Sta_08	8	-0.320
11	Sta_11	11	-0.429
2	Sta_02	2	-0.531
13	Sta_13	13	-0.640
12	Sta_12	12	-0.748
7	Sta_07	7	-0.857
6	Sta_06	6	-1.177
1	Sta_01	1	-1.286

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