



Sveriges lantbruksuniversitet
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Sustainable decision-making

– A case study

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Abstract

Decision making processes are at the core of an organization's capacity to achieve defined sustainability goals. Decision making processes on the other hand, are highly dependent on individuals' actions and biases. Therefore, to achieve defined goals, there must be alignment between organization's sustainability visions and individual's actions.

On the basis of this insight and assumption, this thesis explores factors that influence the way people act within a decision making process. To gain deep and contextual knowledge, this issue is explored in a case study setting.

In this case study setting, the aim of the thesis is to identify the most important elements which have had an effect on individuals' ability to act accordingly to sustainability goals and principles. The case study concerns a decision to renew a high risk water distribution main, in a water utility company, South East Water (SEW), operating in Melbourne, Australia. The Chapel Street decision-making process is significant from the point of view that it is characterized by uncertainty, high risks and limited regarding what constitutes a sustainable solution. The main challenges and difficulties in this case study are not linked to any individual or group. Instead, it is the collective ability to deal with uncertainty, risks and ambiguity, when aligning action with sustainability visions and principles that influences the organization's capacity to achieve sustainability. Challenges are linked to the organizational culture; developed over time in interaction between members of the organization, and thus creating a collective approach of dealing with the characteristics of Chapel Street case.

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1. Background

1.1 South East Water – “Water solution for a better future”

South East Water (SEW) is a water utility company operating in Melbourne, Australia. SEW is responsible for supplying water to the local community including households, businesses, large industries and local councils. As a part of their responsibility SEW manage and maintain pipes, pumping stations, valves and some treatment plants as well as taking waste away. Within their area of responsibilities they are committed to a vision of sustainability, which is: “*water solution for a better future*” (SEW, 2010). The sustainability vision aims to: “*Take a long term view in providing water services to our community, aiming to ensure the protection of the interests of future generations as well as provide optimal value for current community*”(SEW, 2010).

In order to ensure that the sustainable vision is implemented into the organization, SEW have developed a set of principles that are supporting decision-making. The sustainability principles are based on a triple bottom line approach, considering environmental, social and economic opportunities and risks.

1.2 South East Water - Decision to Renew Chapel Street Water Distribution Main

SEW has the responsibility for a large number of pipes and mains supplying water to their community. As such, they have an ongoing program to monitor the condition of the water and pipeline networks. Every year, SEW budgets for expenditure on a range of construction projects including replacements. The budgeting process aims to ensure that required works are prioritized so that money is spent at the right time, and in the right place. The decision to replace a water pipe is informed by pipe age, pipe material and service history (i.e. a record of operational and maintenance incidents relating to the pipe).

During the year 2008, the board management of SEW made a decision to immediately renew one of their high risk water distribution mains on Chapel Street. The Chapel Street water distribution is located in one of Melbourne’s premier shopping district and is well known outside of Melbourne. Within the decision-making process there are several decisions taken starting from the problem identification continuing until construction start. The formal drivers for renewal were the expected frequency of future failures of the mains and the impacts of those failures. With reason of the mains location, the negative impacts of a burst are higher compared to other mains (Item for decision, 2008). Also, the project were motivated from the point of view that it contributes to delivering improved environmental and social outcomes as part of SEW triple bottom line performance by significantly reducing the risk of water main bursts in critical distribution mains (Item for decision, 2008) Within the decision-making process there were several decisions taken, but one of the key issues was to determine the most appropriate time for renewal.

2. Aim

2.1 Problem Description – Alignment between sustainability vision, principles and human action

Decision making processes are at the core of an organization's capacity to achieve defined sustainability goals. Decision making processes on the other hand, are highly dependent on individuals' actions and biases. Therefore, to achieve defined goals, there must be alignment between organization's sustainability visions and individual's actions. On the basis of this insight and assumption, this thesis explores factors that influence the way people act within a sustainable decision making process.

2.2 Aim

The aim of the thesis is to identify important elements which have had an effect on individual's ability to act accordingly to sustainability principles within decision to renew Chapel Street water distribution main.

3 Method

I will use two kinds of sources; primary sources and secondary sources. Primary sources include interviews with key representatives from the water utilities. The key representatives are selected for their role within the decision-process, as well as their willingness and ability to help. Further, I will participate in meetings and everyday life at the water utilities. As secondary sources, I will read site documents relevant for the two specific processes of decision-making. I will also use literature in order to get the theoretical ground.

3.1 Symbolic Interactionism - Definition of Situation as Cause of Human Action

This thesis has applied the methodology and structure of Symbolic Interactionism. Symbolic Interactionism is an epistemological perspective, which takes into account the central qualities of the human being that many other social theories overlook; human action involves choice, creativity, and freedom. Further, it recognizes human actions to be complex and developed over time rather than simple, singular and isolated. The theory is moving away from the mechanical models of causation – characteristic of natural science - towards processual models; “*Processual models emphasize processes – a string of developing factors – those initial stages do not automatically determine their later ones.* (Blumer in Charon, pp.213, 2005)”. In difference to the testing of hypothesis of a few variables, Symbolic Interactionism attempts to understand and explain human behaviour by understanding the meaning the actors themselves give to the situation. People define situations and act accordingly to this definition, implying that if cause of action is to be understood one have to understand the individual's own definition of the specific situation. Cause of action is transformed to mean human defini-

tion, self-direction, and choice. Definition of situation is an active process impossible to predict but through careful and systematic investigation possible to understand. (Charon, 2005)¹

3.1.1 Principles of Investigation

There are several principles of investigation used when applying Symbolic Interactionism, which I have been applying during the work and structure of my thesis. Under each bullet point there is an explanation how the principle of investigation has been applied in this thesis.

- *“It is only possible to understand what is going on if we understand what the actors themselves believe about the world”*. The basic idea is that actors live and know their own world. In order for the researcher to understand actions and social situations, the researcher must understand the actor’s vocabulary, their way of looking and making sense out of the world. The researcher needs to interact with actors, observe and partake in their activities, conduct formal interviews in order to reconstruct their reality. Data should therefore be gathered through observing people in real life settings such as participatory observations and semi-structured interviews. (Charon, 2005)
- *There are two modes of investigation that should be used when aiming to describe the real life situation; exploration and inspection*. Exploration aims to become acquainted with the area of social life by in detail describes what is happening within the situation. Inspection aims to locate important elements. The procedure of inspections is to be flexible, imaginative and creative. (Charon, 2005)
- *“Symbolic Interactionism regards a careful description of the human interaction to be a central goal of social science.”* This means to carry out a careful description of human action, element involved, and a redefinition of these elements. The observer recognize some important central process that is going on followed by a description of them; what people thought, what they did, and what happened, in which situations they occurred and in which situations they did not occur; comparing and contrasting these situations. The purpose is to isolate and carefully describe central concepts that are involved such as conflict, embarrassment, cooperation, definition of situation, problem-solving etc.(Charon, 2005)

3.2 Data collection

The principles of investigation as described by Symbolic Interactionism have been applied during the process of data collection. The data collection follows the two modes of investigation, which are exploration and inspection. Exploration aims to get to know the real life situation through gaining an overview of the entire process, while inspection aims to locate important elements (Charon, 2005). Means of investigation and data collection have been mainly interviews but also a level of participatory Observations

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Participatory Observations

The observation took place during one week at South East Water. Through participating in the day-to-day activities at SEW the possibility was given to informal conversations and interviews as well as reading of informal documents.

Interview form

The aim of the investigation is to understand and explain people's definition of a situation, the case study decision making process. Therefore, semi-structured interviews are more suitable than structured because they allow the scope of questions to emerge with greater understanding. The questions include both open-ended questions as well as more specific questions. The interview questions are designed to give space for sharing, and create common understanding and knowledge of the situation and important elements. The scope of the questions was determined on beforehand but greater understanding and flexibility of the approach allows for adding further questions as the dialogue continues. This giving the opportunity to respond to insights provided by the informant and allows for further probing questions.

The questionnaire was divided into four sections. The scope of the first section was flexible and made up by open-ended questions which allowed individuals to explain the decision-making process from their perspective, in their own words and minimizing the interviewer bias. The use of open-ended questions allowed a joint construction and functioned as a way to build common knowledge.

The second section of the questionnaire involved more specific questions in order to explore a broader number of factors potentially impacting on the decision making process; related to the organizational culture and institutional structure within SEW and how individuals are affected by this context.

The third and fourth sections of the questionnaire aimed to understand individual perceptions of sustainability in order to understand the influence that it had on the decision-making process.

The third section of the questionnaire aimed to investigate individual's general perceptions of sustainability from a societal and organizational point of view. The section had open-ended questions.

The fourth section of the questionnaire aimed to explore the decision-making process from a sustainability perspective in contrast to how the actors already defined sustainability as in section three. The third section involved open-ended questions, but the fourth section had more specific questions aiming to clarify words and central elements. Both the open-ended and the more specific questions had a flexibility of adding further questions, opening up the scope and therefore enabling a dialogue and giving both the interviewer and the interviewees an opportunity to adapt in response to insights about the process.

Interviewees

Altogether 12 individuals were asked to partake in an interview. All of the individuals accepted the invitation. The selection of interviewees was on the basis of their direct and/or indirect involvement in the Chapel Street decision-making process. In addition, some individuals were asked to partake in an interview without having any involvement in the process on the basis that they had expressed concerns about the decision outcome. It was therefore

deemed that did have contrasting views to contribute. The selection of the interviewees was facilitated by contact person on SEW. As a first step, the contact person identified individuals that had been involved in the Chapel Street case as well as individuals that had expressed concerns about the process. Secondly, through the participatory observation – in consultation with contact person - additional interviewees were identified.

Interview data was transcribed though tape-recorder and note taking. In order to simplify the sharing of information that can be experienced as sensitive, the interviews were conducted anonymously. The scheduled time for each interviewee was one hour, but some of the interviews went longer and some shorter depending on the specific interviewee and the discussion that ensued.

3.3 Qualitative analysis and interpretation

According to the theory of Symbolic Interactionism, understanding the cause of actions involves understanding how people define their situation. People act accordingly to their individual definitions made in each specific situation. The qualitative analysis covers people's definition of situation, thinking and actions build on interpretative statements, and central elements for the decision-making process.

The qualitative analysis and interpretation has four steps: (1) introducing actors, (2) describing their actions and what occurred in the decision-making process, (3) cause of action which - in accordance to symbolic interaction – is defined by the actor's views of the situation.

(1) Actors

The first step of the qualitative description focuses on actors. The actors involved in the case study are divided into four categories depending on their general belonging in the SEW organization. The categories represent the organizational structure within SEW. In the qualitative analysis there is a presentation of each group, their roles, responsibilities and influence within the case study decision making process. The individuals within each group are relatively homogenous in their statements, but there are exceptions of individual statements that are not representing the group as a whole but are specific for the individual's point of view. These exceptions are noted where they occur.

(2) Actions within the decision-making process

The second step of the qualitative description explains the decision-making process by providing an overview of the situation. This involves describing people's actions: how people acted, with whom they interacted and what happened at what time in the decision-making process. The decision-making process is described through a timeline of people's action that together generate the whole process, linked with a map of interactions between the groups. It is an interpretation of all the individuals' own explanations of their involvement combined into one process. By combining individual's actions it is possible not only to observe how the single individuals acted, but also to get an overview of the process. The figures provide an understanding of how the individuals acted in relation to each other and how the formal and informal process shaped the decision. By integrating people's actions, missing pieces, contradicting views and inconstancy between actions into a coherent picture, the organizational challenges and difficulties becomes more transparent..

(3) Actor's definition of the decision-making process

The third part in the qualitative analysis describes actors' definition of situation, meaning, thinking and central elements characteristics for the decision-making process in its whole

such as high risk and uncertainty. The actors' definition of the decision-making process is represented by means of key statements. These key statements aims to isolate and carefully describe actors' definitions of the situation in the actors own words, in order to maintain a higher level of objectivity and allow the reader to follow interpretations and conclusion in the discussion. The key statements are shown in a table that demonstrates which statements the actor group of origin, followed by an explanation of the thinking behind the statements as described by the interviewees. This allows for comparison, contrasting and understanding the interrelation between actors' definitions of the situation.

The last part aims to carefully describe central concepts that characterize the decision-making process. Within the case study decision-making process there are two central concepts, namely uncertainty and sustainability. Actors' perspectives on sustainability within the decision-making process influences their definition of how they define sustainable actions and outcomes, and are therefore of particular relevance in relation the aim of the thesis

3.4 Limitations

The decision to replace the chapel street water main was made in 2008. Therefore there is a risk that the actors' understandings have changed since the decision-making process took place, and that their retrospective point of view is different from their understanding at the time. Because of the difficulties to describe everything that has happened during the observations the qualitative analysis is by necessity a selection of events chosen out of their capacity to answer the research questions of the study..

4. Qualitative Analysis and Interpretation

The qualitative analysis aims to provide an overview of the specific situation and to pinpoint and describe central elements by narrowing down features and events into more accurate and precise descriptions. These descriptions include people's thoughts, as they are re-told, what they did, and what happened, in which situations they occurred and in which situations they did not occur. (Charon, 2005)

The qualitative analysis first involves organizing and categorizing data. Secondly, it involves interpretation of the data by attaching meaning and significance of data, explaining patterns, and looking for relationship between the elements. To support understanding, there are numerous descriptions and direct quotations.

The qualitative analysis is divided into three sections (1) description of actors, (2) description of what happened, who was involved when and (3) description of important elements..

4.1 Actors

The actors are arranged into four categories depending on their general role in the organization, and the categories represent the organizational structure within SEW. In this section there is a presentation of each category of actors, their role, responsibilities and influence within South East Water and the Chapel Street case.

Asset and Planning Management (APM) actors

The role of APM actors in the decision-making process was to identify problems; analyze different solutions available as well as make a recommendation to the SEW board management. The recommendations that were suggested by APM were accepted by the board management without reservations or change. Their input in the Chapel Street case was an attempt to balance all the issues that SEW are facing as a water company, and - more specifically - to minimize disruption on customers and community as well as minimize the costs for their customers, by taking on a customer and community perspective. Additionally, part of their tasks is to implement policies and frameworks in their section of the business developed by policy and procedure management.

Policy and Procedures Management (PPM)

Actors with Role and responsibilities category include people involved with community engagement, as well as the development of decision-making tools and policies. This includes the development of guidelines for risk based prioritization. Actors in this category usually have responsibility to communicate the policies and decision-making tools internally within the organization.

The influence of PPM actors in the Chapel Street case was both direct as well as indirect. They were indirectly involved in the decision-making process through the policy and tools that were being used; including sustainability tools and policy, risk management frameworks and social policy. They were directly involved through giving the project and suggested options financial liability, as well as involved in the decision of community engagement later in the process when deciding on the time of construction. The financial liability aimed to build efficiency, minimize cost, whilst maintaining a certain level of service, and ensure that customer gets value for money. The community engagement that took place in the decision-making processes aimed to minimize disruption to the community and avoid outrage from the community concerning the construction works.

Capital Delivery (CD)

Actors in the CD category influence in the Chapel Street case came later in the process when decision of replacement was already accepted. They were involved in the identification of possible solutions; helping to find best alternative of replace the main, as well providing recommendations on options and techniques. They had full engagement in construction, and de-sign of the replacement. This included carrying out community engagement processes in order to define community needs knowing how to best minimize disruption for the community as well as to avoid insurance claims from damages that are not related to the construction, and minimize complains in order to simplify the construction works.

These groups are mainly sub-contractors working indirectly for SEW through other companies - the alliance and the US “utility services”- that are hired directly by SEW. In this category there are exceptions of actors having a distinct role hired directly both by SEW as well as by the US „utility services“. This actor had more influence at an earlier stage in the decision-making process, concerning the renewal, but was not directly involved in the decision-outcome that there would be an immediate replacement.

Operational

Actors in the Operational category were not directly involved within the decision-making process. Their general roles and responsibilities in SEW are to ensure that the community is supplied with quality water by maintaining main, pipes and repairing bursts. Through their practical work with mains and pipes on an everyday basis, operational actors have considerable knowledge about bursts incidents and condition of mains. Normally they are involved in the problem identification of a main that needs renewal but in the Chapel Street case, operational actors had no direct involvement in the problem identification phase.

4. 2 The Decision-Making Process to renew Chapel Street Water Distribution Main

The decision-making process can be described as a sequence of decisions and conceptual processes, starting from the problem identification continuing until construction start. In the studied case, the formal drivers for renewal was the expectation of future failures of the mains, and the impacts of those failures. Because of the location of the large pipe, the negative impacts on the community of a burst are more severe compared to other mains (Item for decision, 2008).

The problem was identified on the basis of a *condition assessment* that undertaken by CSIRO (according to method described by De Silva et al. 2006). As a result of the condition assessment SEW concluded that the main is nearing the end of its service life and that at least the lengths of main with the highest expected community impact from a pipe burst should be immediate renewed. On the basis of the condition assessment, two strategic options were formally suggested:

1. Renewal of the full length of the pipeline,
2. Renewal of only the high risk sections of the main.

A sustainability assessment and cost analysis was undertaken, as well as financial approval was given on the two suggested options. The cost analysis considered both financial as well as social costs. Social costs incorporated potential the expected disruption to commuters and retail traders as well as damage to buildings and vehicles associated with ongoing pipe failures. Aspects considered in the sustainability assessment were: protection the environment, customer service expectations, and concern for impact on the community.

It was perceived risk that community consultation early in the process would lead to unrealistic stakeholder expectations. It was also thought that the outcome of the stakeholder consultation would not influence the decision to proceed with recommended option of replacement. Therefore, stakeholder engagement was not undertaken until after the decision was made by the board. Once the project was approved, the project cost allowed for a high level of stakeholder consultation in order to co-ordinate the requirements and manage expectations between retailers, traffic authorities, tramway management, local council and the public. Once the decision had been made to renew the pipe, the most critical decision in the case study was to determine the most appropriate time for renewal.

4.2.1 Timeline

During the interviews the actors did suggest several alternative outcomes. The different alternatives are shown in the table in relation to their timing in the decision-making process. The different groups did interact more or less during different steps in the decision-making process. The figure in this chapter shows the interactions between the actors through mapping interactions between groups during the decision-making process.

Table 1: Timeline of decision-making process

| The decision-making process | Suggestions of alternative decisions |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <p>1) <i>Identify problem and alternative solution</i> Asset and planning management did the problem identification and were responsible for the condition assessment that was made on the pipe. They concluded that the pipe was in bad condition and needed to be renewed. The condition assessment defines the main as being in high risk of burst considerate of old age and condition. Two options of renewal were attempted to find the most appropriate time for renewal. The first option suggested immediate replacement; the second option suggested doing the replacement in two steps.</p> | <p>A:1 Immediate replacement of the pipe B: Replacement, but a bit now and a bit later</p> |
| <p>2) <i>Financial Viability and sustainability assessment</i> When the two alternatives of renewal had been developed by APM and some representatives from CD, the financial department ensured the two options had financial viability as well as there where a Both options had financial viability and a budget approval. There was also a sustainability assessment made between the two options. The outcome of the sustainability assessment showed that the options had similar outcomes, with the exception of option 1 having slightly lower social costs.</p> | <p>A:1 Immediate replacement of the pipe B: Replacement, but a bit now and a bit later</p> |
| <p>3) <i>Recommendation</i> Management board; been given suggestions of two options of replacement where one options where the recommended one APM did put forward the two options of renewal together with a recommendation their preferred options. In items for the decision the sustainability assessment and condition assessment are attached.</p> | <p>A:1 Immediate replacement of the pipe B: Replacement, but a bit now and a bit later</p> |
| <p>4) <i>Board Approval</i> The board agreed on the recommended options. The options where recommended of the Asset and Planning Management.</p> | <p>A: 1 Immediate replacement of the pipe</p> |

5) *Technical aspect and concerns of the construction.*
 After the approval of the immediate replacement of the pipe CD got involved in the process and planning of the construction. They contributed with suggestions of exactly how the replacement was going to take place; the technical aspects of the construction. Further, CD is responsible for the delivering/construction of the project.

A:2 Immediate replacement of the pipe, but with technical concerns

6) *Community Engagement concerns*
 Under the planning period of the construction there were concerns on the level of community engagement expressed by PPM. Because of the significance as a high risk project, PPM had high expectations on the replacement to be a flagship project from a community engagement perspective. Planning for a higher level of community engagement would lead to a delaying of construction start. The interaction concerning community engagement took mainly place between PPM and CD that had the responsibility of the construction.

A:3 Immediate replacement, but with community engagement considerations

7) *Timeframe considerations*
 CD responded to the community engagement concerns with timeframes considerations; the project start could not be moved forward without delaying the project considerable. There were not sufficient with time in order to satisfy the requests on a high level of community engagement. PPM perceived them as bringing a layer of complexity concerning the construction that was not appreciated.

A:4 Immediate replacement, but with timeframe considerations

8) *Compromise*
 PPM considerations and expectations on a high level of community engagement were compromised since PPM did not want to be responsible for a delaying and a burst. They perceived that a delaying of construction start could lead to an eventual burst that they did not want to be responsible for therefore choose to compromise.

A: 1 Immediate replacement of the pipe

9) *Construction Starts*
 The construction of the main is delivered by CD.

In addition to the alternative outcomes expressed within the formal decision-making process there were *two options that never where expressed within the formal decision-making process.*

C: All alternative outcomes are not explored because of inaccurate decision-making process. Instead the process should have been designed collaboratively in order to explore all options available

D: No replacement

4.2.2 Mapping of Interactions

The different groups did interact more or less during different steps in the decision-making process. The figure below illustrates when in the decision-making process interaction took place and between whom through mapping interactions between groups during the decision-making process. The numbers in the figure are to be connected with the numbers in the timeline above.

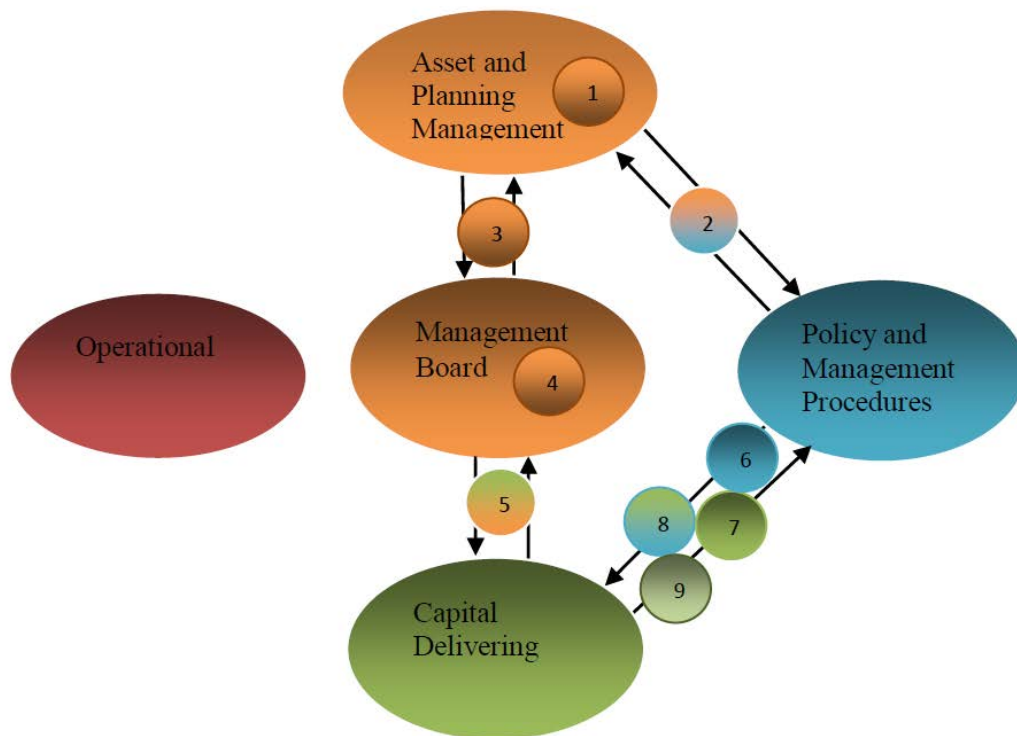


Figure 1 – Interactions during decision-making process.

The interaction that took place in the decision-making process mainly concerned the two options that were suggested by the APM. The process leading to the development of the two alternate decisions have taken place with no or little interaction with the rest of the organization. The involvement of other actors took place first when the two main options of action were already developed, e.g. the sustainability assessments and financial control were only undertaken on the two options developed by the APM.

Further, there is a widely held view in the organization that the pipe is old and therefore in need of immediate replacement. Ideas of alternative decisions exist among actors that were not represented in the formal decision-making process. One of the reasons for this was a sense of urgency and the need not to risk further bursts. The image of the pipe as old and in bad condition prevented actors from pushing forward their concerns. Also, there appears to have been a low level of interactions between individuals with conflicting points of view concerning the decision and the rest of the organization.

4.3 The Actors Definition of the Decision-making process









This section aims to explain how the actors in the decision-making process defined the situation. Symbolic Interactionism argues that people define situation and act out of this definition. The underlying hypothesis is that by understanding people’s definitions of the decision-making process it is possible to understand and explain people’s action. Defining situations is a complex process involving many elements interacting with each other (Charon, 2005).

During interviews the actors have done several statements when explaining and defining the situation. *Through the key statements actors thinking and definition of the decision-making process become apparent.* This chapter provides a description of the key statements expressed by the actors in their own words from a retrospective point of view. In addition, uncertainty and sustainability are two central elements within the decision-making process. Therefore, people’s perspectives on these two elements are described further in this chapter.

4.3.1 Description of Key Statements

A number of key statements are recurring in several of the actor’s definitions. None of the categories have done exactly the same statements, but many of the statements occur as frequently expressed by several of the actor categories. Table 2 shows key statements made by different actor categories. Through the table it is possible to see which key statements that are frequently reoccurring, and who are significant to a specific category. The key statements are further described after the table.

Table 2: Categorization of Key Statements

| Categorizes | Key Statements | Capital Delivering | Operational | Policy and Management Procedures | Asset and Planning Management |
|---------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Service Level | A:1 “Planned disruption is better than unplanned disruption” |  | |  | |
| | A:2 “Run until failure” | |  | | |
| | A:3 “Servicing being provided should not fail” | | | |  |
| Trust | B:1 “I trust these guys” |  | |  | |
| | B:2 “I trust a good decision-making process” | | |  | |
| | B:3 “ I am being trusted with a difficult task” |  | | | |

| | | | | | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Information Availability | C:1 “Information given to the community would minimize negative community reactions” | <input type="radio"/> | | <input type="radio"/> | |
| | C:2 “There were not information available about the decision and decision-making process” | | <input type="radio"/> | <input type="radio"/> | |
| Consequences | D:1 “A burst would have negative consequences on SEW reputation” | <input type="radio"/> | | <input type="radio"/> | <input type="radio"/> |
| | D:2 “A burst would have high social and economical cost” | | | <input type="radio"/> | <input type="radio"/> |
| | D:3” If doing a good job no positive feedback, but if there would be failure negative feedback from the community” | <input type="radio"/> | | <input type="radio"/> | <input type="radio"/> |
| Pipe | E: “Old age on pipe” | <input type="radio"/> | | <input type="radio"/> | |

Service Level

A:1 “Planned disruption is better than unplanned disruption”

The disruption from a construction is less than the disruption caused by eventual bursts. A construction is disrupting for the community and will have social costs. But, the disruption from a construction is possible to minimize by defining the communities needs and adapt to them. The disruption from a construction would be “under control”, it would be possible to prepare the community in order to avoid negative reactions that could have bad influences on SEW reputation. Further, an unplanned disruption in form of a massive burst on Chapel Street would lead to massive flooding on roads and buildings etc. Since Chapel Street is defined as a high profile street a massive burst would lead to serious disruption on the wider community. A massive burst on Chapel Street would have higher economical costs than on other less busy mains. The main approach within CD was that planned disruption is better than unplanned disruption, but there were also people involved expressing themselves more similar to A:3, which is the same actors that are working work close with AP. When these perceived aspects are put together and in relation to each other the actors conclude having a disruption from a construction is better than having a disruption from a burst. They perceive the consequences of a burst being likely a burst would have unacceptable consequences on the community because of the unique area.

A:2 “Run until failure”

The real condition of the main is difficult to investigate since the pipes are underground. To not being able to investigate the pipe fully creates a level of uncertainty of the real condition and time of bursts. The standard procedure to deal with this uncertainty of the pipe condition is

is to allow failures and bursts on the main before replacing it. The amount of failure defines the pipes condition and timing of replacement. This is considerate being the most economical way of handling mains and bursts. Actors pointed out that since there have been no bursts on the Chapel Street main the pipe can not be defined as being in such as poor condition that it is in need of a replacement. Further, the decision to renew should be based on real condition rather than age. There are more factors than age deciding the condition on the main such as which techniques that have used during construction. In relation to this, the actors pointed out, that even if there would be massive bursts on the main the negative impacts on the community and SEW reputation would not have been that severe. Therefore, the conclusion was that there is no reason for not follow SEW practice of “run until failure”, and to replace it before there has been a burst..

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A:3 “Servicing being provided should not fail”

Servicing being provided should not fail is similar to A: 1. the difference is in how they choose to express themselves. With reason of Chapel Street unique location and high profile the negative consequences from a burst would be huge on the community as well as on SEW reputation; they cannot allow “run until failure” on high risk main. There are risks associated with the renewal of the main as well such as tram route, maintain water services etc, but there are sufficient fund to manage. The risk associated with a construction is not comparable with the risk associated with a massive burst. An immediate renewal would reduce water loss and customer disruptions by eliminating further bursts on the main. Within CD some actors expressed that it would have been bad judgment as an asset manager to allow failure on a critical main such as Chapel Street.

Trust

B:1 “I trust these guys”

They have no input in the decision-making procedures themselves but trust the people that have been doing the assessment and been directly involved in identifying problem and solution. As they trust their capacity they see no reason to question the decision. Further, there is also a trust towards the general manager and where they see it as his role to question the decision, not their role.

B:2 “I trust a good decision-making process”

As well people have trust in the decision-making process and have therefore no reason to question the decision. The main part of the group within PPM expressed their trust toward the decision-making procedures. But, there were also actors within PPM expressing scepticism towards the process since. All stakeholders concerned with the renewal were not represented in decision-making process. Instead the process should have been designed collaboratively in order to explore all options available e.g. community and stakeholders role could help to identify a wider range of solution.

B:3 “I have been trusted with a difficult task”

People expressed a feeling of being trusted with a difficult task, and were therefore motivated to do a good job, where a good job means a successful replacement of Chapel Street main. Some actors referred to the trust building practice; if there would be a successful project this would create future benefits and be good for career.

Information Availability

C: 1 "Providing information would minimize community negative community reactions"

Proving information about the construction procedures as well as the consequences of not replacing the main will create resilience towards the replacement among the community. Resilience will minimize negative reactions and therefore ease construction as well as lower eventual negative impacts on SEW reputation.

C:2 "There were no or little information available about the decision and decision-making process and procedures"

Internally, during the decision-making process within SEW there were reaction concerning the lack of information available during the decision making process and the final decision. Individuals believed themselves not being informed in the extend they wished concerning the decision-making process and outcome. They did not receive enough information from the project manager as they wished they had. Also, actors perceived the start day of construction being stressed which lead to a rushed decision. Internally, after the decision-making process there were no follow up concerning the decision. People expressed that the project was more around saving SEW reputation without really bringing everyone's opinion together. A rushed decision could have led to community outrage form the construction.

Consequences

D: 1 "A burst would have high social and economical costs"

Chapel Street is defined as high profile main and is considerate to have a high value for the community. The street is well recognized for its restaurants, shopping as well as being a tourist attraction. A burst in Chapel Street would lead to "major traffic disruption, damage to the road, flooding disruption to trams and cause of loss of trade to many retailers". It is difficult to measure the social cost of a burst in order to compare different alternatives and different aspects. The lack of instrument to measure makes it difficult to compare the different alternatives in order to compare and maximize outcome.

D:2 "A burst would have negative consequences on SEW reputation"(informal)

A burst in Chapel Street would lead to "major traffic disruption, damage to the road, flooding disruption to trams and cause of loss of trade to many retailers". A burst would therefore create massive outrage and complaints from the local community. The outrage among the community from a burst would be mirrored in the media giving, and were SEW would have been responsible for the burst, and the community would blame SEW for allowing services to fail. In combination with this the community has high expectations in the water industry; people expect to always have good quality water. These aspects in relation to each other would harm SEW reputation. Some actors implied that the negative impacts on SEW reputation would be unreparable, and in worse case lead to a reorganization.

D:3 " If doing a good job there are no positive feedback, but if there would be failure there would be negative feedback"

A failure would lead to an investigation internally, and if it turned that the procedures were not followed this would have negative impact on the actors responsible. Externally, among the communities, actors expressed that if they do a good job avoiding burst and deliver a successful replacement there will be no positive feedback. But, if it on the other hand would be a burst or the replacement would fail this would lead to massive negative feedback from community.

Pipe

E:1 "Old age on pipe"

The pipe is underground and therefore it is difficult to investigate the real condition of the pipe. Some actors make the assumption between old age and bad condition; since the pipe is 160 years old they assume that the pipe is in bad condition and needs to be replaced.

4.3.2 Uncertainties

Actors have expressed concerns about the sustainable decision-making tools and processes ability to reflect reality and real risks involved in an accurate way. Further, actors pointed out that the sustainable decision-making tools are subjective, and easy to influence by the individuals applying them. Therefore, some actors expressed that there is an amount of trust involved towards the single individual's ability to do a good job when applying the tools.

There was uncertainty regarding whether the real risks involved in the decision had been articulated in an accurate way and was fully represented in the decision-making process.

The pipe condition was experienced as uncertain by the APM. The real condition of the main is difficult to investigate since the pipes are underground. To not be able to investigate the pipe fully creates a level of uncertainty of the real condition, and time of burst. PPM and CD did not express any uncertainties; instead they were convinced about the bad condition of the pipe. In opposite, operational actors had another point of view; believing that since there was no prior failure, the pipe did not need to be replaced. The APM considered that because of the uncertainties of the pipes condition, it is difficult to determine the risk of a burst; a burst could happen tomorrow or in 15 years. The PPM actors were concerned with delaying the process because of the risk of burst was considerable. Some of the actors identified that because of the risk of a burst; they did not want to put demands on the process. Making demands was perceived to potentially delay the replacement which could lead to a burst they did not want to be responsible for. Actors felt a pressure to start as soon as possible. In addition, several actors expressed uncertainty, when asked, on how to achieve sustainability and what sustainability looks like.

4.3.3 Sustainability

Asset and Planning Management

APM define sustainability as a being a triple bottom line approach taking into account economical, social and environmental aspects that should be in cross balance. Further, actors pointed out that sustainability is not now but in the future. It is about accommodating a future flexibility but at the same time address the needs of today. In the broader sustainability change, APM defines SEW role to be to provide sustainable technology and service to communities. Within the Chapel Street case, sustainability meant having the right information as well as place and cost considerations for pipe replacement. Also, the concept included to consider consequences on water cycle and accommodate for a future flexibility on the ground. Some actors expressed uncertainties about the sustainable decision-making tools and their ability to reflect reality and real risk in an accurate way. Also, they pointed out that the tools are subjective and easy to influence.

There were some actors that had a more technical approach to sustainability. The defined sustainability as a mean of validation applied in the end of the decision-making process, when choosing between already developed options. Further, some also experienced sustainable development as being a possible threat to economic development. This technical approach could not be said representing the groups thinking, but specific to some actors..

Policy and Management Procedures

Similar as above PPM has triple bottom line approach towards sustainability. Further, sustainability should accommodate a future flexibility but at the same time address the needs of today. Actors expressed that sustainability policy is a commitment to the organization and that sustainability tools is embedded in the decision-making process. But, at the same time the actors pointed out those tools could be easily manipulated since it is the individual who asks the questions. Hence, it is necessary to have a level of trust towards the individuals applying them. The actors also thought the decision-making process should be flexible and changeable.

Sustainability within the Chapels Street case meant taking the best decision with best knowledge in order to minimize impacts on the community and the environment. Further, it meant minimize costs but at the same time keep service and ensuring the customer gets value for their money. But, the actors expressed that the main considerations were on the social aspects and trying to understand community expectations. Actors pointed out that the options with least social impacts but highest economical cost were chosen. They expressed that in order for Chapel Street to be sustainable it should be a project undertaken only if necessary at the right timing to minimize impacts.

Further, in the sustainability assessment there was not enough clear information available about the social aspects since the putting a dollar value on social costs is difficult. Some expressed that sustainability is not visible within the process. Sustainability would have meant multitude aspects in the room, and with high stakeholder engagement concerning the construction.

Capital Delivering

CD defines sustainability as something that benefits humans in the long-term. There should be a balance between aspects which are addressing the needs of now as well as future generations. CD points out the value of creating incentives for innovative thinking earlier in the decision-making process. There should be more innovative thinking earlier in decision-making process where real change is possible. Sustainability within the Chapel Street case meant the best outcome that upset the least amount of people. Further, the social aspects were really important- minimum disruption for communities -, but believed that there should be a balance between the social and economical aspects.

Operational

Operational define sustainability as having economical, environmental and social aspects. They think it should be a *balance* between these aspects, but in reality it tends to be more focus on one aspects of sustainability. They perceived that there where a higher consideration to the social aspects compared to economical aspects. Further, operational thinks that the existing innovation program within SEW aiming to encourage sustainable thinking is forced. Instead there should be a culture of innovation e.g. through having good relationships with your boss or colleagues.

5. Discussion

It is when combining the individual actors' perceptions on the situation that the complexity unfolds, and the bigger picture becomes visible. Each actor has a clear image of what happened during the decision-making process and how the decision was made, but it is when combining the individual stories that the contradictions, differences and similarities in the actors' understanding of the situation become clear. What is perceived as a relatively "straightforward" task unfolds in its complexity.

This thesis has identified the most central elements in the process which have had a significant impact on individual actors' actions in the Chapel Street case and later in the decision outcome. The elements that have been identified as having a significant impact on individual actors' definition of the situation and actions in the decision-making process are (1) framing of reality in interaction with others, (2) definition of roles and responsibilities (3) the practice of building trust, and (4) having limited clarity on the definition of sustainability.

(1) Framing of reality in interaction with others

The actors that were not formally involved in the process did perceive the process less uncertain compared to the actors who had a direct influence in the decision-making process. Among the actors not formally involved in the process and which experienced the situation less uncertain there were two different images of the process. On one hand, some actors believed that the pipe was old and therefore in need of immediate replacement, and that a burst would lead to terrible community outrage and negative impacts on the SEW reputation. On the other hand, other actors perceived the pipe as being in such a good condition that it did not need an immediate replacement and that an eventual burst would not have such negative impacts on SEW's reputation. Both sides - right or wrong - did not recognize the complexity facing the decision-makers who had direct involvement in the process, and had simplified views of the situation. The differences between the two groups with simplified views were their level of interaction with the actors having direct input in the decision-making process. The actors that did perceive the pipe as old and therefore in a bad condition, had a higher level of interaction compared to the actors believing that the pipe did not need to be replaced.

According to Symbolic Interactionism, individuals create perspectives on reality in interaction with each other. Communication and interaction between individuals shapes how they perceive situations. There are two aspects to consider explaining why the different groups did not perceive the uncertainty:

- In the case of the actors who did not think the pipe needed to be replaced there was less interaction and information exchange with the actors more closely involved in the decision-making process. This could prevent actors from recognizing uncertainties and other actors' perspective of the situation as well as prevent them from contributing with their perspectives on the situation
- In the case of the second group perceiving the pipe as old there was a level of interaction between the actors. But, in the process of interaction between the two groups, a simplified image of the situation arose which made the situation seem less complicated than it was. A simplified image of reality was communicated. Transferring a simplified image makes the

situation easier to communicate, but at the same time this could prevent other actors to criticize and contribute with their aspects of the decision to the extent that they perhaps ought to be able to.

(2) Defined roles and responsibility

The perception of the pipe as old and therefore in a bad condition arose in interaction between members of the organization. The actors who had a lower level of interaction with the rest of the organization also had a completely different view of the pipe and the situation, and did therefore not perceive the high risks. The exclusion prevented actors from sharing and understands each other's points of views involving risks.

The reason for why operational actors were not partaking or being able to contribute in the decision-making process might relate to the organization's defined roles and responsibilities. They were excluded from interaction because their points of view were not considerate legitimate. Individuals' roles and responsibilities make them legitimate experts within their defined area. Also, operational actors had no formal involvement in the decision-making process and would therefore take no consequences if there were to be an accident. As a consequence, actors having legitimate points of views could have a larger role in the framing process since they were not being questioned of opposite point of views that were excluded from the process.

Individuals that are not agreeing on the organization's legitimate representation of the situation are excluded from the decision making process. Similarly, actors that thought of themselves as bringing complexity were sidelined in the discussions about the decision.

(3) Limited clearness of what sustainability looks like

A majority of the actors expressed that they are committed to the vision of sustainability, but at the same time they expressed a lack of clarity on the definition of sustainability, and whether or not it is achievable. There was a lack of clear guidelines on how to act in accordance to vision of sustainability. This created space for pre-existing values and understanding to guide action thus preventing a change in actions from the status quo. The principles can in the worst case scenario be like a smorgasbord were the individual selecting their action depending on their own preference or taste. As has been identified by the actors themselves, sustainability tools and principles are subjective. But, within the Chapel Street case the individuals own subjective judgment seems to be affected by the accepted views within the rest of the organization.

In cases where sustainable actions and outcome are unclear, actors find a guiding compass within already socially accepted values and norms. Within SEW there seemed to be an agreed representation of what being successful means. In the interviews actors repeatedly brought up the value of maintaining SEW reputation by minimizing community complaints. Because of the abstract nature of the sustainability concept, individuals act on the basis of underlying values and norms created in interaction between members of the group, and thus guiding what is an acceptable action or behavior.

Sustainable decision-making, accordingly to the actors' own definition, involves identifying environmental, social and economical aspects. It involves finding a balance between these aspects whilst taking into account the need of future and current generations. As previously mentioned the Chapel Street pipeline replacement decision was motivated on the basis of the

social aspects of sustainability. Environmental and economical aspects were not the main reasons for the replacement. Actors tried to find a balance between the different interests. Exactly what people mean with balance and how balance should be achieved is not expressed clearly, but as the actors talk about the decision, it seems as if actors understand the word balance as meaning making compromises between interests. The meaning that actors attach to balance seems to involve compromises and tradeoffs. Balance seems to be about finding the “best” compromise. Finding compromise solutions means finding a solution but it also means giving up something. Economical, environmental and social interests that are too valuable to be abandoned define the context in which balance is applied. In fact, the dilemma of sustainability is that it involves interests and values that can’t be given up on and compromised.

Therefore, actors’ definition of sustainability seems to be contradicting in light of some of the problematic issues that the concept has arisen from. In order for a decision to be sustainable, the organization should search for solutions where interests are not compromised. Therefore, using the word balance seems misleading and contradicting, since actors attach a meaning to the concept which involving compromises. The word balance steer people’s mind into thinking that compromises and trades-off are a necessary evil, instead of encouraging actors to find consensus solutions fulfilling all preferences– and these are found expanding beyond the initial scope. The idea of compromises and balance is limiting peoples mind instead of broad-ening their thinking when it comes to finding consensus sustainable action.

(4) Trust Building Practice

Trust fulfills an important function by enabling information sharing and exchange of worldviews between actors in the organization. Trust enables interaction, but similarly, lack of trust excludes people from interaction. In the Chapel Street case, trust was gained through roles and responsibility. Individuals with more influence and responsibility in the decision-making process were more perceived as more trusted than the actors that did not have any direct responsibilities. Within the Chapel Street case, trust came to have an unforeseen impact on the decision. The trust culture came to prevent reflection and questioning of the situation. Abilities that would have been useful when considering the specific characteristics - high risk, strong uncertainties and contradicting views - defining the Chapel street case.

When asked if the actors had any considerations concerning the decision-making process, most of the actors replied that they did not because of the trust they had in the responsible individuals’ ability “to do a good job”. One sentence that illustrates this is: “I trust these guys doing a good job”. The main reason for people not to question or challenge the decision was because they trusted the other individuals who were involved. Hence, they did not find reasons to review the decision process more closely. The statement implies several issues concerning trust which has a direct or indirect impact on the individual’s actions and therefore the organizations ability to deal with the decision making process in an accurate way:

- Actors did not find any reason to reflect upon the decision-making process, and they did not find any reason for expressing concerns because they trusted the people with direct involved ability to handle the situation. *This implies that the reason for raising concerns or reflecting upon the decision would only be necessary if they did not trust the individual’s capacity rather than to have to do with the nature of the decision.* Similarly, raising or expressing concerns could be experienced by the people involved as if their capacity is being questioned.
- Further, the statement implies that as long as there is no reason not to trust in the individual’s capacity other actors will not interfere in the decision. As long as the actors

with direct involvement maintain trust among other actors, their actions will not be questioned.

- Maintaining trust is through what other actors perceive as “doing a good job”. The issue for the individuals involved then became to consider what make other actors perceive a good job. What is the common perspective in the organization on failure and success?

The above discussed mechanism of trust culture is an important process when the actors search for guidelines to take a decision from. The trust culture gives the actors incentives – assuming that they want to maintain trust - to act according to already existing values and to avoid what could be seen as a failure among colleagues. Actors with direct influence within the decision-making process are put in a situation where they are dealing with uncertainties that could put both the specific actors as well as the organization at risk in combination with a pressure to act sustainably. All these aspects that defined the decision were difficult to communicate; and therefore in interaction between actors, the simplified images of the uncertainties arouse. As a consequence, all actors did not fully recognize the complicated nature of the decision and the overwhelming responsibility for a small number of individuals. This simplified image that is transferred in interaction of the situation is eased by the various actors’ unwillingness to question and reflect because of the trust they have in the capacity of the individuals who have direct involvement. In combination, the actors that have direct influence in the situation are directed by individual’s incentives to succeed in order to maintain trust. Success is defined by organizational norms and values held by its members and transferred in interaction. The actors perceive a simplified representation of reality but are still influencing the outcome by simply upholding organizational values, which may not be the accurate guidelines for the specific decision. The actors may not be aware of the organizational values and their influence on the decision, as well as they would value different if they were. Within a complicated decision-making process, attempting to achieve sustainability, failing and succeeding is unclear and not as distinct as an outsider (or insider) with a simplified perception may think.

Trust may prevent actors in the decision-making process from taking risks and explore new solutions as well as prevent actors from reflecting upon the image that they are given and failing to recognize the nature of the decision. But – as argued - trust functions to enable interaction, and where lack of interaction instead excludes people from decision-making process. Trust has had a truly multi-faced impact on the decision.

Sustainability and the Chapel Street Case - Minimize impact or maximize outcome

People’s actions in the process were mainly guided by their defined roles and responsibilities, as framed in interaction between actors and a trust culture. These elements in relation to each other prevented some actors from fully understanding and contributing within the decision-making process, and at the same time gave a few individuals responsibility for a very complex and risky decision. As a consequence there is a risk that the organization as a whole has not taken into account all aspects there are, and thereby limiting its capacity to fully explore alternative outcomes..

6. Conclusions

The challenges and difficulties that SEW faces - when attempting to align individual actions with sustainability visions - within the Chapel Street case are not linked to one or a group of individuals' actions. Instead, it is the actors' collective ability to deal with uncertainty, risks etc, when aligning action with sustainability visions and principles that affects the organizations capacity to: (1) identify environmental, social and economical aspects, as well as (2) finding solutions where such aspects are balanced.

This thesis attempts to identify elements and processes that have an impact on individuals' actions that makes it challenging to align their action with visions of sustainability preventing the organization from producing sustainable outcomes. Within the Chapel Street case, this study has identified several aspects that have important influences on peoples understanding of the situation and which are of significance on people's ability to act accordingly to a sustainability vision.

- *Transferring of simplified images of the situation*

Interaction between individuals shape how situations are perceived. Transferring a simplified image makes the situation easier to communicate, however at the same time this could prevent other actors from criticizing and contributing on the basis of a different perspective. Furthermore, not all actors involved fully recognize the complicated nature of the decision and the overwhelming responsibility for a small number of individuals..

- *Trust*

Trust has a multi-faced impact on the decision. Trust enables interaction, and where lack of trust instead excludes people from decision-making process. But – as argued - trust may prevent actors in the decision-making process from taking risks and to explore new solutions as well as preventing actors from critically reflecting on the representation of the situation that they are given and failing in recognizing the nature of the decision. As a consequence, all aspect needs to be considered or explored or otherwise important alternative solutions may be excluded from the process. The challenges for an organization is to maintain a culture of trust but at the same time make individuals critically reflect on what is happening without being perceived as automatically criticizing other individuals' capacity.

- *An insufficient understanding of what sustainability means:*

At a conceptual level, there is a need to reflect on of the types of solutions that the definition of sustainability implies. An inadequate definition of sustainability steers actors into thinking sustainable solutions involves compromises instead of searching for consensus: The word balance steers actors into believing that compromises are a necessary evil in order to achieve sustainability. Instead, there should be a redefinition which broader peoples mind into thinking about sustainable consensus decisions.

- *Underlying organizational values*

Because of the abstract nature of the sustainability concept, already underlying values and norms come to guide as a compass of what is an acceptable action or behaviour. As argued - this is in particular a problem when all involved actors do not fully recognize the complicated nature of the decision. Therefore there is a need reflect upon these underlying values of the organisation, as well as their accuracy and influence on decision outcomes. It is important to teach individuals about the underlying organizational values and their influence in a specific decision such as what is considerate as failure and success..

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