The Anthropocentric and Ecocentric Perspective with regard to Dutch Water Management

Case Studies of

The Water Framework Directive

and

The Spatial Planning Key Decision *Room for the River*

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Preface

This study has been carried out as part of my master thesis for the Research Master Regional Studies at the University of Groningen – Faculty of Spatial Sciences. The topic of this thesis was chosen due to my fascination of water management in The Netherlands. I could not have achieved bringing this thesis to an end without the help of a number of people, whom I would like to thank for their assistance. First of all I would like to thank my family and my girlfriend for believing in and stimulating me and being there for advice. Secondly, my friends for their advice and exchanging thoughts. Finally, this preface would not be complete without thanks to my supervisors Dr. Johan Woltjer and Prof. Dr. Jos Arts.

Abstract
Currently, there is a lot going on in Dutch water management. New challenges have to be dealt with in The Netherlands and in order to do that the Dutch government chooses to create more space for water. To accomplish creating more space for water, the Spatial Planning Key Decision (SPKD) *Room for the River* has recently been approved by the Dutch parliament. This policy document seems to focus on safety and water quantity issues. On the other hand, the Water Framework Directive (WFD), European legislation concerning water management which The Netherlands is also subjected to and should be taken into account when dealing with the abovementioned challenges and creating more space for water, seems to focus on the protection of water, water quality and ecological issues. These two policy documents seem to differ; they seem to have a different focus and way of thinking. Two perspectives that correspond with this contradistinction are the anthropocentric and ecocentric perspective. The distinction between anthropocentrism and ecocentrism is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is – humans or nature. The SPKD *Room for the River* seems to be more anthropocentric, while the WFD seems to place an emphasis on the ecocentric perspective. What the differences are – in terms of anthropocentrism and ecocentrism – between the SPKD *Room for the River* and the WFD could be interesting to investigate in order to find out whether the focus of these documents is on humans or nature, but also for achieving policy improvement and to contribute to achieving a (more) sustainable environment. Therefore, in this study the anthropocentric and ecocentric perspectives will be clarified and nuanced based on theoretical considerations and it will be indicated how these perspectives produce new knowledge and insight for water management. Furthermore, it will be examined and tested to what extent the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* are anthropocentric and/or ecocentric; the differences will be identified and pointed out. In order to do this a framework for examining and testing will be developed. Finally, it will be suggested what to do with the results of this study in order to achieve policy improvement.

Key words: Anthropocentrism, Ecocentrism, Water Framework Directive, Spatial Planning Key Decision *Room for the River*, Water Management, The Netherlands

Explanation Front Cover Cartoon[1]

Who does not know the story of Hansje Brinker, the Dutch boy who saved The Netherlands by putting his finger in a leaking dike? Since 1950, a monument of this mythical hero can be admired at the Woerdersluis in Spaarndam (near Haarlem). Obviously, the story of Hans Brinker is fiction. In 1865, an American writer named Mary Mapes Dodge wrote a children's book called 'Hans Brinker or the silver skates' in which the adventures of Hans Brinker are at the centre. The Netherlands, mainly Haarlem and its surroundings, is the setting of the stories in this book. Other stories that are not about Hans Brinker are used to amplify his adventures in order to tell the reader something about the history of The Netherlands, Hans' motherland (a heroic representation of the Dutch past takes in an important position in the background of the book). This was necessary, because Dodge wrote this book for American children who knew little about The Netherlands. The heroic deed of the boy who put his finger in the dike can be found in one of the amplifying stories. So, in Dodge her book this boy was not Hans Brinker. In fact the name of this boy was not even mentioned; it is an anonymous hero from the Dutch past. Therefore, the boy has no name in the text under the statue at the Woerdersluis in Spaarndam. One may wonder what the relevance of the front cover cartoon is in relation to the title 'The Anthropocentric and Ecocentric Perspective with regard to Dutch Water Management' and the subtitle 'Case Studies of The Water Framework Directive and The Spatial Planning Key Decision Room for the River'. This will become apparent in the introduction.

[1] Source used for the information and picture: Archiefdienst voor Kennemerland 2007

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Research Outline

1.1 Introduction

Humans have a rich history in managing water resources. In fact, 'for thousands of years, humans have tried to manipulate the hydrological cycle […] to control the movement of water in the hydrological cycle' (Cech 2005, 23)[2]. Human manipulations can also accelerate the cycling of water. For instance, an increase of impervious cover and embanked rivers, leads to accelerated water discharges. The Dutch also have a rich history in manipulating the hydrological cycle and managing water resources. The front cover cartoon (London and Haynes 2001), which displays the boy who put his finger in the leaking dike, illustrates this. Namely, it represents the perpetual struggle of The Netherlands against the water. From the Middle Ages onwards a complex system of physical infrastructure, including dikes, sluices, pumping-stations, and so on, has been developed for the management of water resources in The Netherlands. This infrastructure has been important in keeping the water out; to make sure the Dutch people would keep their feet dry.

Water management in The Netherlands has been focussed on certainties, command and control. It has been directed at keeping the water out in order to provide safety, in which it relied heavily on the aforementioned technology (e.g. dikes, sluices, pumping-stations, Delta Works). However, in recent years it has been recognised that the way The Netherlands has been protected in the past is reaching its limits. In 1993 and 1995, when many parts of The Netherlands had to deal with water nuisance, it was feared that the dikes would not hold. These water nuisance problems stem from new challenges The Netherlands is facing in water management due to climate change and soil subsidence, such as increased river flows and rain (Hidding and Van der Vlist 2003). The new challenges do not only involve dealing with more water. They also involve dealing with water shortages. As Olmstead (2003, 24) points out, there is 'considerable variation in water supply over time and space'; water changes form and location. In other words, water fluctuates. For instance, in river basins influenced by snow or glacier melting, winter run-off will increase, while summer run-off will decrease, due to climate change (Global International Waters Assessment 2006). This is also the case in The Netherlands. Water nuisance occurs in the wetter winter months and water shortages in the dryer summer months.

The Dutch government chooses not to raise the dikes any further in order to deal with these new challenges, because this would not reduce the risk of a flood. Namely, risk consists of flooding probability times consequences and by simply raising dikes the consequences of a flood become graver since most of The Netherlands is below sea level and in certain parts rivers are situated higher than the surrounding area. Also, it does not provide a solution to the water shortages. Therefore, it has chosen alternatives to technical measures such as raising dikes. Its opinion is that water cannot be kept out any longer, but has to be let in and retained for dryer periods. Instead of keeping the water out, the focus is on fitting the water in. Dutch water management should be capable of dealing with uncertainties, instead of certainties, because of increased water fluctuations due to climate change. This means the emphasis should be on a horizontal approach in which more space for water is created, instead of a vertical approach in which dikes are raised any further, so that water can be let in and retained. (Hidding and Van der Vlist 2003; Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer 2001)

However, creating more space for water in The Netherlands is not that simple. Namely, space is scarce in The Netherlands; it is a densely populated country and there are a lot of spatial claims. Obviously, the fact that space is scarce opposite the fact that more space for water is required can lead to conflicts. There are a lot of other spatial functions which have to

[2] The hydrological cycle is a process in which water moves through the lithosphere, hydrosphere, and atmosphere, driven by energy from the sun. 'Water is not created or destroyed in this process but simply changes form and location' (Cech 2005, 24).

be taken into account, such as residential areas, industry, agriculture, and so on. In other words, there is a field of tension between water and other spatial functions. Therefore, it is important that water is considered in relation to its surrounding area; it has to be fitted in well into its surrounding area alongside the other spatial functions. In order to do this, integrated planning has gained ground in The Netherlands in recent years.

Probably the most familiar integrated planning style in The Netherlands is *omgevingsplanning*, which is best translated into English as *over all planning for the physical environment*. This planning style integrates the policy sectors spatial planning, environmental planning, infrastructure planning, and water management (De Roo 2001; Voogd 2001)[3]. A coherent body of thought between these different policy sectors could be useful. Namely, when the many actors involved invoke a common frame of reference this will give a stable direction in planning. Such a coherent body of thought or common frame of reference is better known as discourse or as Faludi (2000) calls it 'doctrine'. For instance sustainable development is such a doctrine, as mentioned by De Roo (2001).

Relevant to mention in the context of creating more space for water is that in The Netherlands the Spatial Planning Key Decision (SPKD) *Room for the River*, which focuses on creating more space for water, has recently been approved by its parliament. The SPKD is a national policy instrument, which is drawn up at ministerial level. On 25 January 2007 the SPKD *Room for the River* has been approved by the Dutch parliament (Ruimte voor de Rivier 2007b). 'The document presents an integrated spatial plan with the main objectives of flood protection, master landscaping and the improvement of overall environmental conditions' (Ruimte voor de Rivier 2007a).

As discussed above, until recently Dutch water management has been directed at keeping the water out in order to provide safety; to make sure the Dutch people would keep their feet dry. It is reasonable that safety issues and water quantity issues took up and still take up an important position in Dutch water management, because when a flood does occur this will have major consequences. However, water should no longer be considered as an enemy, but increasingly as an ally. Instead of fighting against the water, we should be fighting for the water, which means that water quality and ecological issues are also important and should therefore be considered.

The Water Framework Directive (WFD), European legislation concerning water management which The Netherlands is also subjected to and should be taken into account when dealing with the abovementioned challenges and creating more space for water, focuses on these issues. This directive entered into force on 22 December 2000 and has as its primary goal the protection of water. Instead of focusing on safety and water quantity issues as is the case in the SPKD *Room for the River*, it mainly focuses on water quality and ecological issues (Environment Directorate-General of the European Commission 2007). These two policy documents seem to differ; they seem to have a different focus and way of thinking. Two perspectives that correspond with this contradistinction and could be useful to consider it are the anthropocentric and ecocentric perspective.

The distinction between anthropocentrism and ecocentrism is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is of the environmental ethic[4] – humans or nature (Xu Huiying 2004; Nash 1989 in Kortenkamp and Moore 2001). The basic thoughts of the anthropocentric perspective date back to the Enlightenment. Although Descartes already discussed the essence of anthropocentrism, that nature exist only for the benefit of human beings and has no

[3] Environmental planning is directed at the quality of the natural environment while spatial planning is directed at the human manipulations and additions to the natural environment.

[4] Environmental ethics examines the relationship between human beings and nature from the moral perspective (Xu Huiying 2004, 16).

intrinsic value itself, the term anthropocentric was not used before the 1860s. In the 1860s it was used for the first time 'amidst the controversy over Darwin's theory of evolution, to represent the idea that humans are the center of the universe' (Campbell 1983 in Kortenkamp and Moore 2001, 262). The ecocentric perspective on the other hand assumes that humans are only a smaller part of a greater ecological whole (Grendstad and Wollebaek 1998). Ecocentrism is a nature-centred perspective which came into existence in the second half of the 20th century. This perspective was forwarded by the environmental movement *Deep Ecology* – put forward in the early 1970s by the Norwegian philosopher Arne Naess – as a reaction to the anthropocentric perspective (Steans and Pettiford 2005; Brown 1995; Fox 1993). The Deep Ecologists were the first to use the term ecocentrism or ecocentric ethic in the 1970s, which refers to the idea that all life has intrinsic value. This "comes from the term first coined 'biocentric' in 1913 by an American biochemist, Lawrence Henderson, to represent the idea that the universe is the originator of life" (Campbell 1983 in Kortenkamp and Moore 2001, 262).

'Traditional' Dutch water management can be considered as human-centred or anthropocentric. This is also displayed by the front cover cartoon as it symbolizes the perpetual struggle of The Netherlands against the water. But how is this with the WFD and the SPKD *Room for the River*? Are these more anthropocentric or ecocentric? As follows from the abovementioned the SPKD *Room for the River* focuses on creating more space for water, safety and water quantity issues, which can be considered as being more anthropocentric. The WFD on the other hand seems to place emphasis on the ecocentric perspective, with its focus on the protection of water, water quality and ecological issues (Environment Directorate-General of the European Commission 2007).

1.2 Scope of the Research

Problem Definition
Currently, there is a lot going on in Dutch water management. New challenges have to be dealt with in The Netherlands and in order to do that the Dutch government chooses to create more space for water. To accomplish creating more space for water, the Spatial Planning Key Decision (SPKD) *Room for the River* has recently been approved by the Dutch parliament. This policy document seems to focus on safety and water quantity issues. On the other hand, the Water Framework Directive (WFD), European legislation concerning water management which The Netherlands is also subjected to and should be taken into account when dealing with the abovementioned challenges and creating more space for water, seems to focus on the protection of water, water quality and ecological issues. These two policy documents seem to differ; they seem to have a different focus and way of thinking. Two perspectives that correspond with this contradistinction are the anthropocentric and ecocentric perspective. The distinction between anthropocentrism and ecocentrism is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is – humans or nature. As already discussed, the SPKD *Room for the River* seems to be more anthropocentric, while the WFD seems to place an emphasis on the ecocentric perspective. What the differences are – in terms of anthropocentrism and ecocentrism – between the SPKD *Room for the River* and the WFD could be interesting to investigate in order to find out whether the focus of these documents is on humans or nature, but also for policy improvement and to contribute to achieving a (more) sustainable environment.
Based on the aforementioned the following research objective and research questions have been formulated:

Research Objective
The objective of this study is to clarify and nuance the anthropocentric and ecocentric perspectives based on theoretical considerations and to indicate how these perspectives produce new knowledge and insight for water management. Furthermore, it will be examined and tested to what extent the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* are anthropocentric and/or ecocentric. This means that differences – in terms of anthropocentrism and ecocentrism – between these two policy documents will be identified and pointed out. In order to do this a framework for examining and testing will be developed. Finally, it will be suggested what to do with the results of this study in order to ultimately achieve policy improvement.

Main Research Question
To what extent are the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* anthropocentric and/or ecocentric?

Research Questions

- What are the theoretical considerations for the dissension between the anthropocentric and ecocentric perspective?
- How can the anthropocentric and ecocentric perspective be brought into one framework in order to use it in practice?
- How can this framework be applied to the EU Water Framework Directive?
- How can this framework be applied to the Spatial Planning Key Decision *Room for the River*?

Hypotheses

- The Water Framework Directive is ecocentric.
- The Spatial Planning Key Decision *Room for the River* is anthropocentric.

The dissension between anthropocentrism and ecocentrism serves as the thread in this study. Why has this dissension between anthropocentrism and ecocentrism been chosen? Or in general: What is the relevance of this study?

In the context of Dutch water management – i.e. creating more space for water in order to deal with new challenges such as climate change and soil subsidence – the SPKD *Room for the River* and the WFD seem to have a contradictory focus. Namely, the former seems to focus on safety and water quantity issues, while the latter seems to place an emphasis on the protection of water, water quality and ecological issues. This is exactly what the dissension between anthropocentrism and ecocentrism is about. It is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is – humans or nature.

In a broader perspective, another aspect why the dissension between anthropocentrism and ecocentrism is relevant relates to sustainable development. In recent years, we have become more and more aware of the abovementioned relationship between us humans and nature, or more specifically the impact we humans have on nature. Therefore, the term sustainable development has become increasingly popular in recent years. When the anthropocentric and ecocentric perspectives are better tuned to each other this could add to achieving a (more) sustainable development. More specifically, when we for instance know to what extent the WFD and SPKD *Room for the River* are anthropocentric and/or ecocentric – so we know what their anthropocentric and ecocentric characteristics are – then subsequently it can be investigated what policy strategies can/should be developed. This can lead to policy improvement. Questions that can be derived from this are for instance: What should the mix between anthropocentric and ecocentric characteristics look like? Or, how should these be filled in and tuned? How should (Dutch) decision makers/policy makers fit this in/implement this? For instance, should the mix be more anthropocentric and/or ecocentric?

However, before questions like these can be answered, the first step is to develop a framework. Subsequently, this framework is applied to the WFD and the SPKD *Room for the River*. The framework will be based on (the theoretical considerations of) anthropocentrism and ecocentrism and should be considered as a thinking framework, or so to say the glasses/goggles we look through in order to, in this study, examine and test the WFD and the SPKD *Room for the River*. Afterwards we can look what we can do with/learn from this new knowledge and insight, for instance thinking of the development of policy strategies.

The WFD and the SPKD *Room for the River* serve as the case studies in this study. These two policy documents have been selected because of their relevance and topicality. Relevance in terms of (new challenges in) Dutch water management, creating more space for water and their different focus as mentioned above. In fact, these two policy documents are inextricably bound up with the context of this study. Topicality, because their implementation is happening right now. Namely, each Member State of the European Union has to implement the WFD and The SPKD *Room for the River* has recently been approved by the Dutch parliament, which makes it current as well.

1.3 Conceptual Model

As discussed earlier, water can be managed in a more anthropocentric or a more ecocentric way. Therefore, in this study the dissension between anthropocentrism and ecocentrism is discussed in relation to water management. This can be displayed by a tug of war match. In the tug of war match, anthropocentrism and ecocentrism are competing with each other for water management (Figure 1-2).

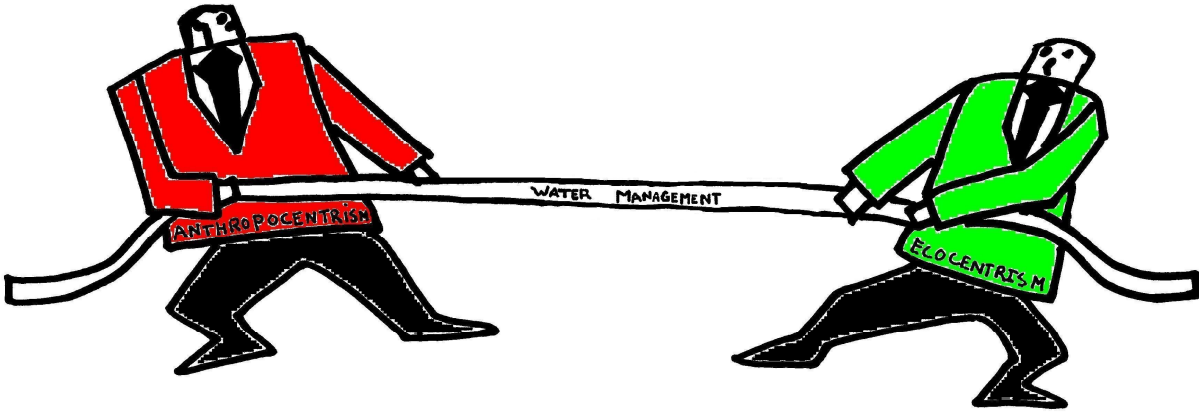

Figure 1-2 Anthropocentrism and Ecocentrism Competing for Water Management[5]

The rope in this tug of war match can be considered as a spectrum. Namely, water management can be more anthropocentric or more ecocentric. Ideally, water is managed in a way that is both anthropocentric and ecocentric. In that case these two perspectives are not competing for how water should be managed.

In a more abstract way, the abovementioned figure displaying the tug of war match looks like the box presented in Figure 1-3. The box in this figure displays the dissension of anthropocentrism and ecocentrism as a spectrum. Namely, it goes from red (anthropocentrism) to green (ecocentrism). It does not necessarily mean that the optimum is in the middle, because this is also context-related. Every case is different and while one may require a more anthropocentric approach, the other might require a more ecocentric one.

Figure 1-3 Water Management – The Dissension between Anthropocentrism and Ecocentrism as a Spectrum

As discussed in section 1.2, I will clarify and nuance the anthropocentric and ecocentric perspectives based on theoretical considerations. Based on these insights a framework for examining and testing will be developed in order to investigate to what extent the Water Framework Directive and Spatial Planning Key Decision *Room for the River* are anthropocentric and/or ecocentric. This leads to the conceptual model displayed below in Figure 1-4. The model also shows that a bridge between theory and empirical will be created; theory will be brought into practice.

[5] The tug of war match is based on an illustration from fotosearch http://www.fotosearch.com/IMZ134/jde0015/.

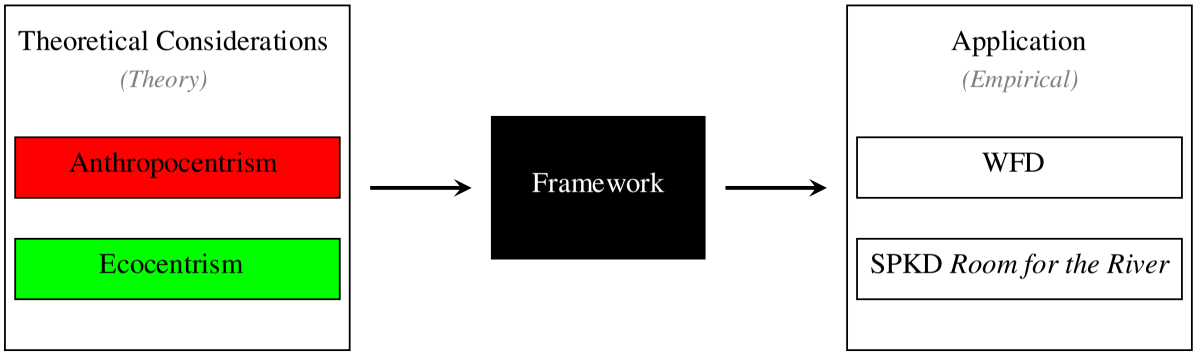

Figure 1-4 Conceptual Model

1.4 Structure of the Report

As follows from the research outline, the dissension between anthropocentrism and ecocentrism is at the centre in this study. To point out to what extent the Water Framework Directive (WFD) and the Spatial Planning Key Decision (SPKD) *Room for the River* are anthropocentric and/or ecocentric, first the theoretical concepts anthropocentrism and ecocentrism will be clarified and nuanced. In relation to these concepts, sustainable development will also be discussed. Based on the theories, a framework will be developed which will be used to investigate to what extent the WFD and SPKD *Room for the River* are anthropocentric and/or ecocentric. This will all be done in chapter two. This also means that the further operationalisation, based on the theoretical considerations, necessary to carry out this study can be found in chapter two. In chapter three the framework is applied to the WFD and in chapter four to the SPKD *Room for the River*. The conclusions are described in the final chapter, chapter five. In order to carry out this study – i.e. the theoretical considerations, developing the framework, applying the framework to the cases, and the conclusions – an extensive literature study has been performed. The two policy documents WFD and SPKD *Room for the River* have been read and delved into based on the developed framework. Furthermore, secondary literature played an important role.

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Theoretical Framework

In this chapter, the framework for investigating to what extent the Water Framework Directive and the Spatial Planning Key Decision Room for the River are anthropocentric and/or ecocentric will be developed. As discussed, this framework will be based on anthropocentrism and ecocentrism. Therefore, first anthropocentrism will be described in section 2.1 and ecocentrism in section 2.2. Anthropocentrism and ecocentrism take in an important position in environmental ethics. According to Xu Huiying (2004, 16), "environmental ethics examines the relationship between human beings and nature from the moral perspective". Nash (1989 in Kortenkamp and Moore 2001) discusses different ways of understanding this relationship. He argues that perhaps the most important is the distinction between anthropocentrism and ecocentrism, "because this determines what is the focus of the environmental ethic – humans or nature" (Nash 1989 in Kortenkamp and Moore 2001, 262). The dichotomy between anthropocentrism and ecocentrism is discussed in 2.3. In this section, the outcomes of section 2.1 and 2.2 are placed opposite each other. In recent years, we have become more and more aware of the relationship between humans and nature, or more specifically the impact we humans have on nature. Therefore, the term sustainable development has become increasingly popular. Sustainable development is described in section 2.4. Based on the theoretical considerations in sections 2.1 to 2.4 the framework has been developed in section 2.5.

2.1 Anthropocentrism

The basic thoughts of the anthropocentric perspective, in which humans are considered as the masters of the Earth, date back to the Enlightenment. This philosophical movement rested on the belief that *reason* could be used to resolve a multitude of human problems and 'would much improve the material well-being of humankind' (Steans and Pettiford 2005, 210). The Enlightenment was all about achieving *progress*. According to this movement, humans are capable of improving social, economic, and political life, because they are able to understand rational principles. It refers to a great trust in development and progress by technology and science. Aside from improving social, economic, and political life, human ingenuity and scientific reason can also be used to subdue nature. This belief in rationality and science stimulated the confidence in humankind as master of the Earth. (Steans and Pettiford 2005)

The Enlightenment started with the French philosopher Descartes (1596-1650) (De Roo and Voogd 2004). The ideas of Descartes are deeply imbedded in the anthropocentric perspective. Descartes considered the natural world as a machine, which could be understood by reducing natural processes to mechanical laws. He argues that nature is dead; it is merely matter in motion. Given this fact, 'there is no moral dilemma in using nature for our own purposes' (Steans and Pettiford 2005, 211). This brings us to the very essence of anthropocentrism, that 'nature exists only for the benefit of human beings and has no intrinsic value' (Steans and Pettiford 2005, 211).

Although Descartes already discussed the essence of anthropocentrism, that nature exist only for the benefit of human beings and has no intrinsic value itself, the term anthropocentric was not used before the 1860s. In the 1860s it was used for the first time 'amidst the controversy over Darwin's theory of evolution, to represent the idea that humans are the center of the universe' (Campbell 1983 in Kortenkamp and Moore 2001, 262). Anthropocentrism is a human-centred perspective; it puts humankind at the centre of all life. According to this perspective 'humankind is the highest purpose of existence in the world; human values are the noblest and the sole values' (Xu Huiying 2004, 19). The central issue in the anthropocentric perspective is the relationship between humans and nature. Humans are considered the most important life form and other forms of life only have value when they affect or are useful to humans. The same applies to nature as a whole; nature is only of

importance when it harms or benefits humans. McShane (2007, 172) strikingly describes this relationship between humans and nature as follows: 'anthropocentrism claims that the nonhuman world and/or its parts have value only because, and insofar as, they directly or indirectly serve human interests'. This means that nonhuman things can be made valuable based on only one feature, namely serving human interests. Eckersly (1992) endorses this. He argues that, according to the anthropocentric perspective, the nonhuman world can be considered as a storehouse of resources and that it has instrumental value only; 'it is valuable only insofar as it can serve as an instrument, or as a means, to human ends' (Eckersly 1992, 26). (Eckersley 1992; Grendstad and Wollebaek 1998; Kortenkamp and Moore 2001)

Xu Huiying (2004) states that anthropocentrism also reflects a kind of expectation humans hold for life. He argues that humans are always trying to attain a better life. They attempt to create a better environment by utilizing natural resources and hope that the world will develop in a way they desire; a world they consider to be ideal. Driven by such a desire, human beings will never be satisfied with the present. Due to the manifestation of their power, humans 'have caused damages to the earth that are hard to heal' (Xu Huiying 2004, 19). These damages played an important role in the advent of another perspective: ecocentrism.

2.2 Ecocentrism

The ecocentric perspective came into existence in the second half of the 20th century. Various factors have been important for the advent of this perspective. First of all, Rachel Carson's book *Silent Spring* (1962), which discussed the dangers of pesticide use, resulted in an increased interest in the environment. It is since this time that the perception of the environment as a limitless resource to be exploited was replaced by a view that it is vital to the existence of humanity; 'human beings should be living with nature, rather than triumphing over it' (Steans and Pettiford 2005, 208).

As discussed in section 2.1, humans have caused damages to the earth that are hard to heal. These damages also played an important role in the advent of ecocentrism. Examples are highly publicised environmental disasters such as the meltdown of the nuclear reactor of Three Mile Island (USA) in 1979, gas-leaks at the Union Carbide factory at Bhopal (India) in 1984, and the meltdown of the nuclear reactor of Chernobyl (Ukraine) in 1986. Furthermore, publications of doom-laden predictions about the future, such as the Club of Rome's *Limits to Growth* report published in 1972[6], have been influential. In recent years the interest in the environment has increased again due to environmental threats such as, most notably, global warming. (Steans and Pettiford 2005)

Ecocentrism is a nature-centred perspective which was forwarded by the environmental movement *Deep Ecology* – put forward in the early 1970s by the Norwegian philosopher Arne Naess – as a reaction to the anthropocentric perspective (Steans and Pettiford 2005; Brown 1995; Fox 1993). Fox (1993, 75) even states that "in recent years, the most concerted attempt to challenge the anthropocentric tradition has come from a loose grouping of philosophers writing under the banner of Deep Ecology". The Deep Ecologists were the first to use the term ecocentrism or ecocentric ethic in the 1970s, which refers to the idea that all life has intrinsic value. This "comes from the term first coined 'biocentric' in 1913 by an American biochemist, Lawrence Henderson, to represent the idea that the universe is the originator of life" (Campbell 1983 in Kortenkamp and Moore 2001, 262).

[6] In the *Limits to Growth* report it was argued that environmental factors would soon place restrictions on humanity's predominantly growth-oriented attitude and/or lead to disaster. The report was significant in that it stimulated discussion, debate and research, and offered an alternative to this attitude. (Steans and Pettiford 2005)

The ecocentric perspective regards humanity's place in nature; it states that humans should be considered as 'a smaller part of a greater ecological whole' (Eckersly in Grendstad and Wollebaek 1998, 654), because 'there is no valid basis to the belief that humans are the pinnacle of evolution and the sole locus of value and meaning in the world' (Eckersly 1992, 28). Why the opposite was believed by anthropocentrists can according to Chapman (1991, 1356) be explained by the fact that 'as human beings we find it easier and much more comfortable to look at a small part of the environment and try to fit it into our artificial schemes (reductionist thinking) than to try to take in the whole picture and adapt our thinking to that reality (holistic thinking)'. He also argues that 'we have grown used to changing our environment to suit ourselves. This always seemed to work in the past and did not appear to require the consideration of long-term implications' (Chapman 1991, 1356). The ecocentric perspective argues for environmental balance and advocates an egalitarian attitude towards nature (Brown 1995). According to ecocentrism 'nature deserves moral consideration because it has intrinsic value, value aside from its usefulness to humans' (Kortenkamp and Moore 2001, 262). Others (Brown 1995; Eckersly 1992; Fox 1993) also mention ecocentrism argues that the nonhuman world has intrinsic value; that it can be valued for its own sake.

Eckersly (1992, 28) points out that ecological interconnectedness, which is given special emphasis in the ecocentric perspective, is the basis for 'a greater sense of compassion for the fate of other life-forms', which he names a greater sense of *empathy*. He also argues that it is the basis for 'a keener appreciation of the fact that many of our activities are likely to have a range of unforeseen consequences for ourselves and other life-forms' (1992, 28), which he names a greater sense of *caution*.

As a reaction to anthropocentrism, ecocentrism argues that the trust in development and progress by technology and science – by using *reason* – has been violated repeatedly, especially considering the many disasters that have occurred due to technical and/or human failure. Based on the aforementioned paragraphs, it is not hard to imagine that ecocentrism speaks of an environmental crisis. This perspective argues that the environmental crisis is evidence of 'an inflated sense of human self-importance and a misconceived belief in our capacity to fully understand biospherical processes' (Eckersly 1992, 28). Obviously, it is impossible for human beings to fully understand such processes, because our information processing capacity is limited, there is uncertainty about the completeness and accuracy of the information, and there is an inherent uncertainty of the future.[7] As a corrective to the inflated human self-importance and the misconceived belief in our capacity to fully understand biospherical processes, the ecocentric perspective points out human beings should proceed with greater caution and humility in their interventions in ecosystems (Eckersly 1992).

[7] Simon (1993; 1995) therefore argues that rationality is bounded; he speaks of *bounded rationality*.

2.3 Dichotomy Anthropocentrism and Ecocentrism

It has already been discussed in section 2.2 that ecocentrism was a reaction to anthropocentrism. According to Kortenkamp and Moore (2001, 262), "a distinction between these two concepts was first brought into social science research by Dunlap and Van Liere (1977) in a comment on Heberlein's (1972) article *Land Ethic Realized*". Since anthropocentrism and ecocentrism are two opposing perspectives, the term dichotomy is used. In order to briefly reflect on this dichotomy, a table has been drafted in which the most notable point of views from section 2.1 and 2.2 have been put opposite each other (see Table 2.1).

Anthropocentrism	**Ecocentrism**
Human-centred	Nature-centred
Humans most important life form	Humans not sole locus of value and meaning in the world – instead: environmental balance and ecological interconnectedness
Nature has no intrinsic value	All life has intrinsic value
Nature is only of importance when it harms or benefits humans; nature exists only to serve human interest	Egalitarian attitude towards nature; humans smaller part in greater ecological whole
(No moral dilemma in) using nature for our own purposes	Empathy – greater sense of compassion for the fate of other life forms
Reason; humans able to understand rational principles	Impossible for human beings to fully understand biospherical processes
(*Reason* used to) subdue nature	Caution and humility – a keener appreciation of the fact that many of our activities are likely to have a range of unforeseen consequences for ourselves and other life-forms
Trust in development and progress by technology and science – by using *reason*	The many disasters that have occurred due to technical and/or human failure say otherwise
Reductionist thinking	Holistic thinking

Table 2.1 Opposing Point of Views of Anthropocentrism and Ecocentrism

2.4 Sustainable Development

Sustainability or sustainable development is a fuzzy notion, of which many definitions and classifications have been provided. (Gibson et al. 2005) The most frequently used definition of sustainable development is the one mentioned in *Our Common Future*, commonly referred to as the Brundtland report. In this report, sustainable development is defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. (World Commission on Sustainable Development 1987) A more comprehensive definition is given by McKinney and Schoch (2003) who define sustainable development as 'development that focuses on making social, economic, and political progress to satisfy global human needs, desires, aspirations and potential without damaging the environment'. Another comprehensive definition of global sustainable development is 'the wise use of resources through critical attention to policy, social, economic, technological, and ecological management of natural and human engineered capital so as to promote innovations that assure a higher degree of human needs fulfilment, or life support, across all regions of the world, while at the same time ensuring intergenerational equity'. (EOLSS Publishers 1998, in: Rosen and Dincer 2001, 8)

Probably, the most familiar classifications are those that suggest that sustainability rests on a number of interconnected pillars. There are classifications with two, three, five, and even more intersecting pillars. The two pillar version has a human and ecological pillar. The three pillar version, which consists of an economic, social, and ecological pillar, is perhaps the most popular. The classification with five intersecting pillars distinguishes a political/institutional, economic, social, ecological, and cultural pillar. (Gibson et al. 2005)

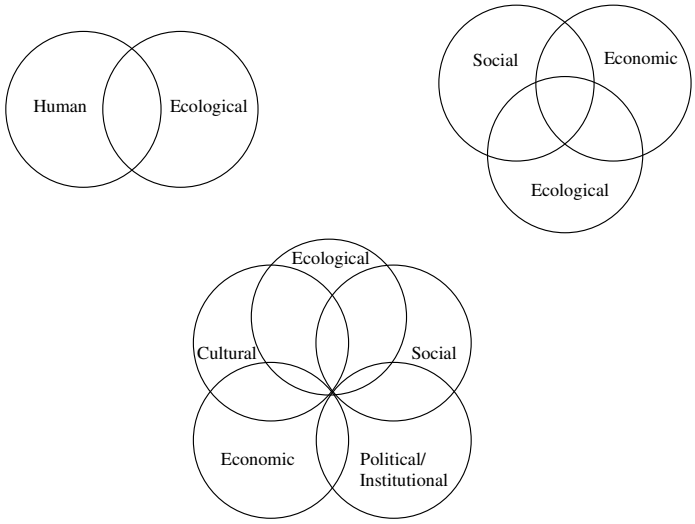

Figure 2.1 Intersecting Pillars of Sustainability

Gibson et al. (2005, 56) point out that 'focusing on these pillars is convenient because they are traditional fields of policy making, scholarly enquiry and specialized research'. However, there is a pitfall to such classifications. Although the pillars are interconnected and interdependent, 'reliance on the traditional pillars makes it too easy to continue thinking only within the old administrative, academic and technical boxes' […]. Namely, 'any exercise that puts things in separate categories tends to obscure what is overlapping and shared' (Gibson et al. 2005, 56). Since sustainability is about linkages, interconnections, and interdependencies, focussing on the dichotomy between the anthropocentric perspective and ecocentric perspective mentioned in section 2.3 – considered as a spectrum – instead of on these seperate categories can be useful. Namely, in order to achieve a more sustainable development the whole discussion on what the focus is – humans (anthropocentrism) or nature (ecocentrism) – and finding a good balance between these two perspectives could be valuable. However, as discussed earlier first insight into to what extent – in this study – the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* are anthropocentric and/or ecocentric is necessary. In order to find this out a framework will now be developed. It should be noted that the focus is on the two perspectives, the components and criteria have merely been used to operationalise these perspectives.

2.5 Framework: Components and Criteria

In order to examine and test to what extent the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* are anthropocentric and/or ecocentric, anthropocentric and ecocentric criteria were selected. According to Maimone (2006, 74), 'there is no single approach to criteria selection; however, it is useful to develop evaluation criteria that cover the primary categories of impacts'. Maimone distinguishes the following impact categories:

- Biological Impacts
- Financial and Economic Impacts
- Habitat Disturbance Impacts
- Institutional Considerations
- Political Considerations
- Social Impacts
- Technical Considerations
- Water Quality Impacts
- Water Quantity Impacts

These impact categories were filled in with the anthropocentric and ecocentric criteria. Given the fact that the development of anthropocentric and ecocentric criteria has not been done before, alternatives had to be looked for. The distinction between the anthropocentric term *quality of life* and the ecocentric term *environmental quality* proved useful to select anthropocentric and ecocentric criteria. This will now be discussed.

According to Van Kamp et al. (2003) both quality of life and environmental quality refer to the person, the environment and the relationship between both.

Quality of life is a complex and multi faceted concept. Massam (2002) argues that agreement, among scholars and policy-makers, as to what the precise definition of this concept is, seems to be little. Mitchell et al. (2001 in Van Kamp et al. 2003, 9) also state that 'there is no agreement yet on quality of life, in terminology nor in construction methods or the criteria that comprise quality of life'. However, Massam (2002, 145) does argue that there is general agreement among various authors that 'a meaningful definition of quality of life must recognize that there are two linked dimensions to the concept, namely a psychological one and an environmental one'. Grayson and Young (1994 in Massam 2002, 145) recognize these two dimensions. They distinguish 'an internal psychological mechanism producing a sense of satisfaction or gratification with life' and 'external conditions which trigger the internal mechanism'. Dissart and Dellar (2000 in Massam 2002, 145) also describe this internal/external dichotomy. They point out that there are 'exogenous (objective) facts' of a person's life and 'endogenous (subjective) perceptions' a person has of these facts and of himself or herself. It is often argued that the psychological and environmental dimensions need to be combined in order to provide a complete picture of a person's or place's quality of life. Subjective as well as objective indicators should be used in order to measure quality of life (Marans 2003).

The fact that quality of life is subjective to a large extent can be explained by the fact that the term *quality* is subjective. According to Milbrath and Sahr (1975, 399), quality lies in the eyes of the beholder; 'it is a perception or a feeling that something is good or right or enjoyable'. This means that human judgments/perceptions and experiences play a key role in

assessing quality of life (Eyles 1990).[8] As with quality of life, both objective and subjective evaluations have to be employed in order to obtain a proper understanding of environmental quality (Pacione 2003). Namely, environmental quality is also subjective, because humans value the environment and the use of it in their own way (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer 2001). Milbrath and Sahr (1975, 398) point out that 'objective indicators of environmental conditions are extremely useful'. This refers to for instance the environmental impact. Namely, some impacts can be harmful to us humans and/or the environment, but we fail to notice them because they are not detectable by our ordinary senses. The authors state that subjective indices are not useful for such detective purposes and therefore 'advocate the development and use of objective indicators of the condition of our environment' (Milbrath and Sahr 1975, 398-9).

After this short explanation it is not relevant for this study to discuss this any further into detail, because it is not the purpose of this study to investigate quality of life or environmental quality. The whole discussion about objective and subjective can therefore be put aside. However, what is relevant for this study is the list of indicator categories and determinants mentioned by Hancock et al. (1999 in Massam 2002). Based on these indicator categories and determinants, anthropocentric and ecocentric criteria were selected. Obviously, these criteria are dedicated and assigned in a way which is in line with table 2.1. For instance, it is not hard to imagine that a criterion such as "protection of flora and fauna" relates to "empathy" and is "nature-centred", or that "resource consumption" relates to "(no moral dilemma in) using nature for our own purposes" and "nature is only of importance when it harms or benefits humans; nature exists only to serve human interest", which is "human-centred". The impact categories mentioned by Maimone were used to categorise the criteria. Therefore, a financial and economic, institutional, political, social, technical, and water quantity component has been selected for the anthropocentric perspective. A biological, habitat and water quality component has been selected for the ecocentric perspective. The components and criteria for each perspective are displayed in Table 2.2.

Again I want to underline that the components and criteria were merely used to operationalise the anthropocentric and ecocentric perspective. I do not tend to put things into seperate boxes – the old administrative, academic and technical boxes. The goal is to say something about the extent of the anthropocentric and/or ecocentric perspective of – in this study – the Waterframework Directive and the Spatial Planning Key Decision *Room for the River*. Based on this insight the discussion on "should it be more anthropocentric and/or ecocentric" can start in order to ultimately achieve a (more) sustainable development and policy improvement.

[8] Not only is quality of life based on human perceptions, but also the determination of appropriate standards of quality of life. (Eyles 1990)

Anthropocentric Perspective		**Ecocentric Perspective**	
Component	*Criteria*	*Component*	*Criteria*
Social	- Equity - Resource consumption - Security (safety/shelter) - Health (physical/mental) - Happiness - Life satisfaction - Liveability - Vitality - Prosperity (non-financial) - Beauty - Sense of "neighbourhood"	Water Quality	- (Hazardous) substances - Concentrations - Pollution - Emissions - Protection - Discharges - Deterioration - Waste reduction - Toxics reduction
Water Quantity	- Floods - Droughts - Water storage - Drainage - Creating more space for water	Biological	- Ecosystem health - Ecological interconnectedness - Ecological recovery - Protection of flora and fauna (intrinsic value) - System approach
Institutional	- Amendments - Plans - Administrative arrangements - Legislation - Programmes - Measures - Approaches - Initiatives - Strategies	Habitat	- Diversity - Setting/context - Distinctiveness - Rarity - Ecosystem
Political	- Decision-making - Public Involvement - Information services		
Technical	- Monitoring - (Analysis) Methods - Technical formats - Scenarios		
Financial and Economic	- Financial success (costs/benefits)		

Table 2.2 Components and Criteria for the Anthropocentric and Ecocentric Perspective

- 3 -

Water Framework Directive

3.1 Anthropocentric Perspective

In this section of chapter three the anthropocentric characteristics of the Water Framework Directive (WFD) will be investigated based on the framework provided in chapter two. This means that this document has been investigated based on the specified components and criteria.

3.1.1 Social

Water as a Heritage

One of the first things mentioned in the WFD is that water should be considered as a heritage instead of as a commercial product; 'a heritage which must be protected, defended and treated as such' (European Parliament and European Council 2000, 1). This relates to a number of criteria selected for the social component, namely: health, life satisfaction, happiness, liveability, beauty, prosperity, and sense of "neighbourhood". First of all, water as a heritage relates to the health of humans. Health can be divided into physical and mental well-being. Water as a heritage can improve the mental well-being of humans, because it could add to the life satisfaction and happiness of humans, but also to the liveability of the environment humans live in. Therefore, water as heritage can improve the health of humans. Secondly, water should be considered as something beautiful; an object that delights the senses and/or exalts the mind. In this sense beauty has a strong link with health, and more specifically mental well-being. Namely, beauty is something that can influence the earlier mentioned criteria such as happiness and liveability, and therefore also the mental well-being, of humans. Furthermore, water as a heritage relates to prosperity. Prosperity is often expressed in financial success, which is relevant for water as a heritage in that it generates money by for instance tourism or indirectly in that it can for example be a good investment climate for companies. However, in this sense it can also be understood as 'non-financial success', because water as a heritage can simply be considered as the amount of capital available, which does not necessarily mean the value has to be expressed in terms of money. Finally, when considering water as a heritage people can relate to a certain place, they develop a sense of "neighbourhood". As a concluding remark I would like to point out that it can obviously be concluded based on the abovementioned that considering water as a heritage is very anthropocentric.

Figure 3.1.1 Water as a Heritage: View of the Danube in Budapest (Source: The Huz Experience 2005)

Drinking Water

The WFD recognizes the importance of water for the abstraction of drinking water. Relevant in this matter are equity, resource consumption, health, and vitality. In terms of equity, 'water for personal and domestic uses is a fundamental human right of all people and a pre-requisite to the realisation of all other human rights'; water should be sufficient, safe, acceptable, physically accessible, and affordable (United Nations World Water Assessment Programme 2006, 520). In the WFD it is described that 'good water quality will contribute to securing the drinking water supply for the population' (European Parliament and European Council 2000, 3) and that 'the supply of water is a service of general interest' (European Parliament and European Council 2000, 2). In terms of resource consumption for agriculture an enormous amount of water is needed for the irrigation of land and for industry a large amount of water is needed as cooling water. In fact 'irrigation is by far the largest water user in Europe' (Massarutto 2003, 100). The abstraction of drinking water is also very relevant for the health of humans, in this case the physical well-being. Namely, without sufficient drinking water humans become ill. Eventually humans will die without sufficient drinking water, not only because humans need clean and safe drinking water, but also because a secure food supply depends on it. Namely, it is needed for the irrigation of land (United Nations World Water Assessment Programme 2006; Jermar 1987). Equity, resource consumption and health relate to vitality. Vitality in this sense means that water is necessary to live, grow or develop. As a concluding remark I would like to point out that based on the aforementioned this is also a very anthropocentric characteristic.

Figure 3.1.2 Drinking Water (Source: Society Promoting Environmental Conservation 2003)

Security

One important item has not been discussed so far, namely security. Security involves safety and shelter. For instance, in The Netherlands, a delta which is often referred to as the drain of Europe, water quantity issues involving safety and shelter play an important role. Although these water quantity issues are important for a Member State such as The Netherlands, they are neglected in the WFD. As a matter of fact, water quantity issues are subordinate to water quality issues in the WFD. This will be discussed in the water quantity component in subsection 3.1.2. One could argue that security is taken into account by the diversity principle, the principles of subsidiarity, and the grounds for exemptions to some extent. First of all, relating to the diversity principle, in the WFD it is recognized that different specific solutions are required, because of diverse conditions and needs in the Community. 'This diversity should be taken into account in the planning and execution of measures to ensure protection and sustainable use of water' (European Parliament and European Council 2000, 2). For

instance in The Netherlands water quantity issues take in a more important position. Secondly, subsidiarity means that it is the responsibility of the Member States to implement the WFD. Finally, the WFD talks of grounds for exemptions. For each Member State there are grounds for exemptions from the requirement to prevent further deterioration or to achieve good status of water, described in the WFD. For instance, when the failure to prevent or achieve this is the result of new sustainable human development activities in favor of the 'overriding public interest and/or the benefits to the environment and to society are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development', or when there is talk of *heavily modified bodies of water* (European Parliament and European Council 2000, 11). Despite the diversity principle and the principles for subsidiarity with the grounds for exemptions, the WFD does not have enough attention for security in the sense discussed above. However, it should be noted that especially the grounds for exemptions are very anthropocentric.

Figure 3.1.3 Are Security Issues Neglected in the WFD? (Source: Agilent Technologies 2007)

3.1.2 Water Quantity

It has already been discussed earlier that water quantity issues are subordinate to water quality issues in the WFD. This becomes apparent in two statements. First of all it is stated that 'control of quantity is an ancillary element in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established' (European Parliament and European Council 2000, 2). In the second statement it is described that common definitions of the status of water in terms of quantity should be established where relevant for the purpose of the environmental protection. It has also been mentioned earlier that the WFD does not have enough attention for security. However, this is an important criterion with regard to water quantity, especially considering recent floods and droughts throughout Europe due to climate change. In order to provide safety, extreme (higher and lower) water levels have to be dealt with. Also, providing safety by dealing with extreme (higher and lower) water levels is essential for humans to live, grow, or develop. For instance, the high population density in the lower parts of The Netherlands (meaning below sea level) and the fact that about two-thirds of the gross national product is earned in this area leads to great damage in case of flooding (Ministerie van Verkeer en Waterstaat 2000).

Overall, the water quantity criteria such as floods, droughts, water storage, drainage and creating more space for water are underexposed or not present. As already mentioned, water quantity is subordinate to water quality (Figure 3.1.4), which is rather ecocentric.

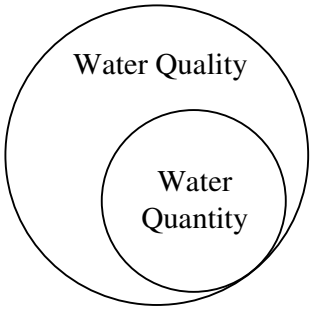

Figure 3.1.4 Water quantity issues are subordinate to water quality issues; they are only relevant for the purpose of water quality issues.

3.1.3 Institutional

The implementation of the WFD, which is obligatory for the Member States of the European Union, requires a lot of institutional arrangements. The most obvious arrangements concern the river basin approach applied in the WFD. Namely, it is stated that Member States have to produce a river basin management plan for each river basin district that lies entirely within their territory and assign a river basin covering the territory of more than one Member State to an international river basin district. Equally, if not more important is the statement that Member States have to ensure the appropriate administrative arrangements, for instance identifying the appropriate competent authority, that are necessary for implementing this Directive within each river basin district lying within their territory.

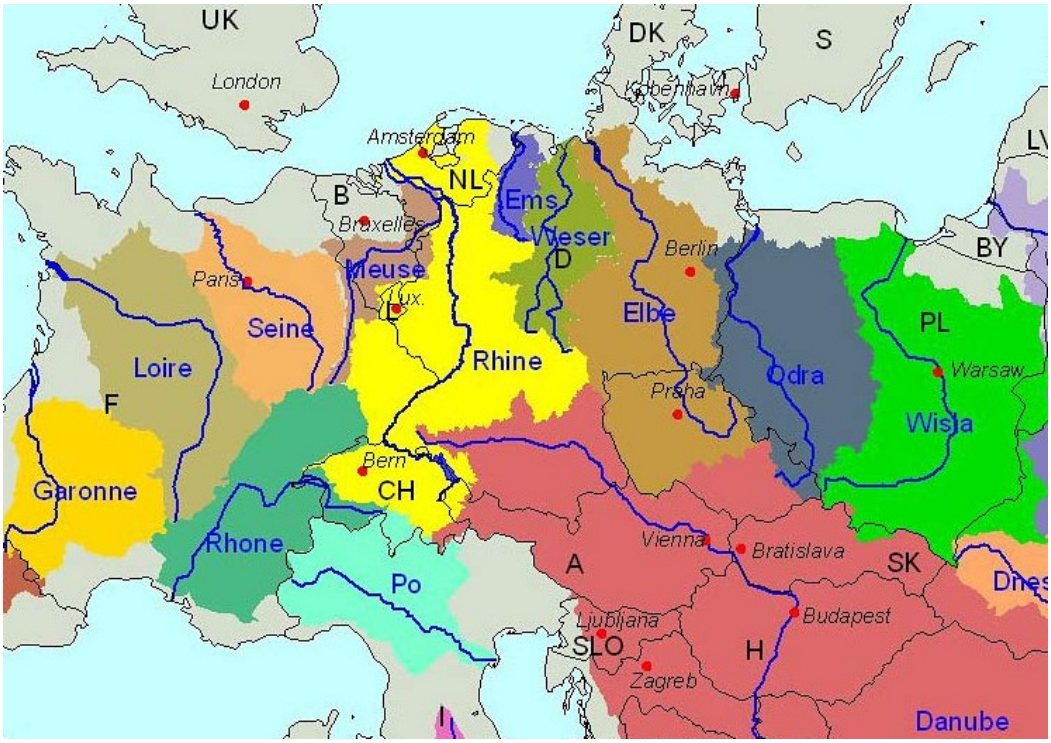

Figure 3.1.5 River Basins (Source: Central Washington University 2006)

Member States do not only have to ensure a proper application of the rules of this Directive. Also, the WFD points out that they have to ensure 'full implementation and enforcement of existing environmental legislation for the protection of waters' (European Parliament and European Council 2000, 5). In order to ensure that the rules of this Directive throughout the Community are properly applied, it is described that appropriate penalties should be developed and implemented in Member State legislation. Furthermore, it is pointed out that the penalties have to be effective, proportionate and dissuasive and that programmes of measures have to be established by each Member State in order to achieve the objectives established in the WFD. The establishment of these programmes of measures is facilitated by the Commission. The requirements of the WFD and in particular the programmes of measures should be coordinated for the whole of the river basin district.

It is stated in the WFD that its success relies, among other things, on 'close cooperation and coherent action at Community, Member State and local level' (European Parliament and European Council 2000, 2). For instance, coordination is required between Member States that are part of international river basin districts. Member States may also report issues, which have an impact on the management of their water but cannot be resolved by themselves, to the Commission and any other Member State concerned. Also, 'where a river basin district extends beyond the territory of the Community, the Member State or Member States concerned shall endeavor to establish appropriate coordination with the relevant non-Member States' (European Parliament and European Council 2000, 8).

A final remark relevant for this institutional component is that the WFD 'should provide a basis for a continued dialogue and for the development of strategies towards a further integration of policy areas' (European Parliament and European Council 2000, 2). It is pointed out that the protection and sustainable management of water should be further integrated into other Community policy areas such as agriculture, energy, transport, fisheries, regional policy and tourism.

Although institutional arrangements, that humans try to fit things into their own artificial schemes, are anthropocentric, the river basin approach can be considered as a move away from this. Namely, this is an approach which focuses on natural boundaries. It also takes on a more holistic view in that it considers land and water in relation to each other. Therefore, the river basin approach can be considered as more ecocentric.

Figure 3.1.6 River basins: a more natural (biological) division
(Source: North Carolina Wildlife Resource Commission 2007)

3.1.4 Political

The political component relates to decision-making, public involvement and information services. It is stated in the WFD that its success relies on information, consultation and involvement of the public, including users. Also, it relates to the fact that Member States have to 'encourage the active involvement of all interested parties in the implementation of this Directive, in particular in the production, review and updating of the river basin management plans' (European Parliament and European Council 2000, 16). In the WFD it is described that in order to ensure the participation of the general public including users of water in this, proper information of planned measures has to be provided and progress of implementation has to be reported to the general public before final decisions on the necessary measures are adopted. Member States have to 'allow at least six months to comment in writing on those documents in order to allow active involvement and consultation' (Ibid). Obviously, Member States also have to report to the Commission. They have to submit the river basin management plans, summary reports, and interim reports.
Furthermore, it is pointed out in the WFD that the Commission also contributes to providing information. Namely it shall publish:

- A report on the implementation of the WFD at the latest 12 years after the Directive entered into force,
- A report on progress in implementation based on summary reports of Member States, and
- An interim report describing progress in implementation based on interim reports of the Member States.

Also, there are two other actions of the Commission that relate to providing information described in the WFD. First of all, in order to comment on the abovementioned implementation reports, the Commission shall convene a conference of interested parties on Community water policy from each of the Member States. This is also a good opportunity for sharing experiences. Secondly, every year the Commission shall present an indicative plan to the Committee in which measures that will have an impact on water legislation are described.

Although the political component is rather human-centred, there is a tendency towards ecocentrism. Namely, there is a growing awareness of the impact humans (also see section 2.2) have on the environment and that the succes of the WFD relies on information, consultation and involvement of the public, including users.

3.1.5 Technical

The technical component, when considering the WFD, involves for instance monitoring of surface water status, groundwater status and protected areas. Namely, in the WFD it is pointed out that 'technical specifications and standardized methods for analysis and monitoring of water status shall be laid down' (European Parliament and European Council 2000, 12). It is also described that these technical specifications, such as criteria for evaluation of water status, should also be laid down so that a coherent approach is provided for in the Community as part of the WFD. Furthermore, 'for the purpose of transmission and processing of data, including statistical and cartographic data, technical formats may be adopted' (European Parliament and European Council 2000, 19). In the WFD it is stated that monitoring of water status is required, because the acquired information provides a sound basis for the development of the already mentioned programmes of measures. Obviously, this should be done on a systematic and comparable basis. Therefore, as already mentioned, a coherent approach is necessary. In order to provide a coherent approach for the Member

States, it is pointed out that ‘adaptation of certain technical elements to technical development and the standardization of monitoring, sampling and analysis methods should be adopted by committee procedure’ (European Parliament and European Council 2000, 5) and the Commission may adopt guidelines on the application of, for instance, the abovementioned criteria for the evaluation of water status. As discussed in section 2.5, some impacts can be harmful to us humans and/or the environment, but we fail to notice them because they are not detectable by our ordinary senses. It is impossible for human beings to fully understand biospherical processes. This technical component displays a move away from the anthropocentric thoughts on *reason*. Instead this component is rather ecocentric in this sense.

3.1.6 Financial and Economic

The financial and economic component relates to prosperity in terms of financial success, including costs and benefits. First of all, it is pointed out in the WFD that the ‘protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations, including coastal fish populations’ (European Parliament and European Council 2000, 2), which relates to prosperity (Figure 3.1.6).

Figure 3.1.7 Economic Benefits of the Protection of Water Status (Source: ShipData 2003)

What also relates to this are the statements on costs in the WFD. In order to implement the WFD, Member States go to a lot of expense. Therefore, they may phase the implementation of the programmes of measures to spread the costs of implementation. Furthermore, also relating to costs, it is pointed out in the WFD that ‘in cases where a body of water is so affected by human activity or its natural condition is such that it may be unfeasible or unreasonably expensive to achieve good status, less stringent environmental objectives may be set’, which is anthropocentric in that costs are placed above the environment (European Parliament and European Council 2000, 3).

However, there are some restrictions to this. It is pointed out in the WFD that if a Member State aims at achieving less stringent environmental objectives for a specific body of water, it has to meet the following conditions (European Parliament and European Council 2000, 10):

- The environmental and socioeconomic needs served by such human activity cannot be achieved by other means, which are a significantly better environmental option not entailing disproportionate costs;

- Member States ensure,

  for surface water, the highest ecological and chemical status possible is achieved, given impacts that could not *reasonably* have been avoided due to the nature of the human activity or pollution,

  for groundwater, the least possible changes to good groundwater status, given impacts that could not *reasonably* have been avoided due to the nature of the human activity or pollution;

- No further deterioration occurs in the status of the affected body of water;

- The establishment of less stringent environmental objectives, and reasons for it, are specifically mentioned in the river basin management plan and those objectives are reviewed every six years.

The second condition mentioned above shows some 'weakness', because what is reasonable? Obviously, this is a subjective term and who decides what is reasonable then? As pointed out in chapter two, *reason* is something that relates to the anthropocentric perspective, which makes the abovementioned conditions also rather anthropocentric.

Finally, relevant to mention for the financial and economic component is the principle of recovery of the costs of water services, which is also described in the WFD. This means that damage or negative impact on the aquatic environment leading to environmental and resource costs should be taken into account based on, particularly, the polluter-pays principle. Necessary for this is 'an economic analysis of water services based on long-term forecasts of supply and demand for water in the river basin district' (European Parliament and European Council 2000, 4).

3.2 Ecocentric Perspective

Now the same will be done for the Water framework Directive (WFD) from an ecocentric point of view. This means that the ecocentric characteristics of the WFD are investigated based on the framework – i.e. components and criteria – provided in chapter two.

3.2.1 Water Quality

Ultimate Aim of the WFD

In subsection 3.1.2 it has already been discussed that water quantity issues are subordinate to water quality issues in the WFD. Water quality issues take in an important position in the WFD, if not the most important. In fact, the WFD's ultimate aim is 'to achieve the elimination of priority hazardous substances and contribute to achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances' (European Parliament and European Council 2000, 6). It is stated that the WFD should at least contribute to progressively reducing such hazardous substances to water. It aims at the maintenance and improvement of the aquatic environment in the Community, which is a purpose that is primarily concerned with water quality.

Figure 3.2.1 The ultimate aim of the WFD is to achieve the elimination of priority hazardous substances and contribute to achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances (Source: STARfish 2007)

Purpose
The purpose of the WFD is to establish a framework, that is aimed at the protection of inland surface waters, coastal waters, transitional waters, and groundwater, which (European Parliament and European Council 2000, 5):

- prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- promotes sustainable water use based on long-term protection of available water resources;
- aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and
- contributes to mitigating the effects of floods and droughts

Thereby it also contributes to a number of other things. First of all, it can add to the provision of the sufficient supply of good quality water, surface water as well as groundwater, necessary for sustainable, balanced and equitable use of water. Secondly, pollution of groundwater can be significantly reduced. Thirdly, it can contribute the protection of territorial and marine waters. Finally, it can add to the achievement of objectives of relevant international agreements.

Environmental Objectives
It is pointed out in the WFD that in order to achieve the aims, concerning water quality, set out in the WFD, environmental objectives should be set. These environmental objectives should ensure the achievement of at least good status of surface water, including good ecological potential and good surface water chemical status, ánd good status of groundwater throughout the Community. Furthermore, these objectives should ensure deterioration in the status of waters at Community level is prevented. If a body of water already has a good water status, it should be maintained. ‘For groundwater, in addition to the requirements of good status, any significant and sustained upward trend in the concentration of any pollutant should be identified and reversed’ (Ibid) in order to progressively reduce pollution of groundwater.

Protected Areas
As becomes obvious from the previous paragraph, in order to protect, enhance, and restore all bodies of water, a distinction is made between surface waters and groundwater for the environmental objectives in the WFD. Besides surface waters and groundwater, protected areas are distinguished. In the WFD, when speaking of protected areas, it is pointed out that Member States have to ‘ensure the establishment of a register or registers of all areas lying within each river basin district which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water’ (European Parliament and European Council 2000, 12).

Combined Approach

In the WFD it is pointed out that Community water policy should be based on a combined approach for point and diffuse sources (see Figures) in order to prevent and control pollution. In this approach, pollution is controlled at the source through the setting of environmental quality standards and emission limit values. It is described that the Member States have to ensure that discharges are controlled according to the combined approach. They shall ensure the establishment and/or implementation of (European Parliament and European Council 2000, 13):

- the emission controls based on best available techniques,
- the relevant emission limit values, or
- in the case of diffuse impacts the controls including, as appropriate, best environmental practices

Questions at hand concerning pollution of water originating from diffuse sources are different from the same questions at hand concerning point sources such as industry. In case of diffuse sources there is a large amount of individual polluters which are not approachable separately through permits. Examples are shipping, traffic, agriculture and households (Helpdesk Water 2006).

Figure 3.2.2 Point Source (Source: 1minutemanager 2005)

Figure 3.2.3 Diffuse Source (Source: Onderwijscoördinator Binnenvaart 2005)

Strategies against Pollution of Water

In order to deal with pollution, strategies against pollution of water are discussed in the WFD. This involves specific measures that are adopted by the European Parliament and the Council to prevent and control pollution of water, including surface water and groundwater, by individual pollutants or groups of pollutants which present a significant risk to or via the aquatic environment. It is described that a proposal has to be submitted by the Commission in which a list of priority substances is set out. These substances are selected amongst the individual pollutants or groups of pollutants presenting a significant risk. Prioritization for action has to be based on the risk to or via the aquatic environment of these substances. The risk has to be identified by risk assessment and targeted risk-based assessment, which focuses solely on human toxicity and on aquatic ecotoxicity via the aquatic environment. The risk-based assessment procedure is based in scientific principles and takes particular account of (European Parliament and European Council 2000, 17):

- evidence regarding the intrinsic hazard of the substance concerned, and in particular its aquatic ecotoxicity and human toxicity via aquatic exposure routes, and
- evidence from monitoring of widespread environmental contamination, and
- other proven factors which may indicate the possibility of widespread environmental contamination, such as production or use volume of the substance concerned, and use patterns.

Furthermore, it is stated in the WFD that the Commission submits proposals of controls for the priority substances in order to progressively reduce discharges, emissions and losses of these substances; particularly the cessation or phasing out of the discharges, emissions and losses, including an appropriate timetable for doing so. The Commission shall also 'identify the appropriate cost-effective and proportionate level and combination of product and process controls for both point and diffuse sources and take account of Community-wide uniform emission limit values for process controls' (European Parliament and European Council 2000, 18). Furthermore, proposals for quality standards are submitted by the Commission; quality standards that are 'applicable to the concentrations of the priority substances in surface water, sediments or biota' (Ibid).

Obviously, the abovementioned aspects relating to water quality – whether it is about attention to (hazardous) substances, emissions, discharges, toxics and waste reduction and so on – show that the WFD is ecocentric to a large extent.

3.2.2 Biological

Obviously, the biological component is also very much present in the WFD. However, a lot of statements pointed out in the WFD that relate to this component have already been mentioned in the previous subsection about water quality. Examples such as the elimination of priority hazardous substances, or at least the progressive reduction of discharges, emissions and losses of such substances are important to improve ecosystem health or at least ecological recovery. This also accounts for establishing and implementing emission controls and emission limit values, or the strategies against pollution of water to name a few. The 'problem' with these statements is that they all are aimed at water quality and are therefore discussed under the water quality component. Another example is the combined approach which also distinguishes diffuse pollution sources. This relates to the criterion ecological interconnectedness. A statement that has not been mentioned in subsection 3.2.1, which is relevant for the biological component is that the protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations, including coastal fish populations. Naturally, not the economic benefits are important in this sense, but the protection of fish populations, which relates to the criterion protection of flora and fauna. However, it should be noted that the protection is for human interest, not because of the intrinsic value of other species. The conservation of habitats and species, mentioned in *protected areas*, does recognise the intrinsic value of other species. Except the protection of fish populations, which is an anthropocentric characteristic, the biological component is clearly ecocentric. Another criterion which endorses this is the systems approach. This criterion will be discussed in the following paragraph.

There are several statements which indicate that a system approach is applied in the WFD. First of all, it is pointed out that Member States have to identify the individual river basins that lie within their national territory. These river basins have to be assigned to individual river basin districts. Secondly, it is stated that 'the objective of achieving good water status should be pursued for each river basin, so that measures in respect of surface water and

groundwaters belonging to the same ecological, hydrological and hydrogeological system are coordinated' (European Parliament and European Council 2000, 4). Thirdly, the hydrological cycle, which is discussed in relation to the purposes of environmental protection, indicates a system approach. Namely, natural flow conditions of water should be taken into account in order to integrate qualitative and quantitative aspects of surface waters as well as groundwaters more for the purposes of environmental protection. These examples also indicate a more holistic thinking.

3.2.3 Habitat

In subsection 3.1.1 it has already been discussed that the WFD points out that different specific solutions are required, because of diverse conditions and needs in the Community. 'This diversity should be taken into account in the planning and execution of measures to ensure protection and sustainable use of water' (European Parliament and European Council 2000, 2). In 3.1.1 this relates to the social component and more in particular security. However, diversity can also relate to the habitat component. For instance, the WFD also points out that 'an effective and coherent water policy must take account of the vulnerability of aquatic ecosystems located near the coast and estuaries or in gulfs or relatively closed seas, as their equilibrium is strongly influenced by the quality of inland waters flowing into them' (Ibid). This does not only relate to the criteria diversity and ecosystem, but also to distinctiveness and setting/context. Namely, the vulnerability of such ecosystems can be considered as distinctive, which also varies per and depends on setting/context. Obviously, the aforementioned examples are ecocentric characteristics.

The criterion that has not been discussed so far for this component is rarity. As already mentioned in subsections 3.2.1 and 3.2.2, in *protected areas* the conservation of habitats and species has been pointed out. Although this is not discussed from a rarity point of view, it is still an ecocentric characteristic in that it is not for the benefit of humans; instead it recognises the intrinsic value of habitats.

3.3 Summary

In this section, the main findings of sections 3.1 and 3.2 are summed up. First of all, the most striking anthropocentric characteristics of the Water Framework Directive (WFD) will be discussed and subsequently the most striking ecocentric ones. Probably the most obvious anthropocentric characteristics are considering water as a heritage and the importance of water for the abstraction of drinking water. Other examples include the use of *reason* in order to achieve less stringent environmental objectives, the phasing of implementation of the programmes of measures to spread the costs, the grounds for exemptions, and the economic benefits of protecting water (i.e. the protection of fish populations).

It could already be noticed in section 3.2 that the ecocentric characteristics are much more prominent. First of all, this is reflected by the main goal of the WFD: Achieving the elimination of priority hazardous substances and contributing to achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances. There are also a lot of other ecocentric characteristics. For instance, the fact that water quantity is subordinate to water quality, the use of the river basin approach, the environmental objectives, the protected areas, the conservation of habitats and species, and the strategies against the pollution of water. Another example involves the growing awareness of the impact humans have on the environment and that the success of the WFD relies on information, consultation and involvement. Obviously, the protection of inland surface waters, coastal waters, transitional waters, and groundwater is also an ecocentric characteristic. Furthermore, monitoring water status, the use of the combined approach, and the diversity principle are ecocentric characteristics.

- 4 -

Room for the River

4.1 Anthropocentric Perspective

In this section of chapter four the anthropocentric characteristics of the Spatial Planning Key Decision (SPKD) *Room for the River* will be investigated based on the framework provided in chapter two. This means that this document has been investigated based on the specified components and criteria.

4.1.1 Social

The most obvious example mentioned in the SPKD *Room for the River* that relates to the social component is the safety issue. The main goal of this SPKD is that, according to the cabinet, safety must be in accordance with the normative drainages at Lobith and Borgharen, concerning the Rhine and Meuse respectively, which have been specified in 2001 (Figure 4.1.1). This involves a normative drainage of 16.000 cubic metres per second at Lobith and 3.800 at Borgharen. The whole of measures and possible following measures necessary as a result of these higher normative drainages, that have to be realised at the latest in 2015, will have a large impact on the river system; both locally and regionally.

Figure 4.1.1 The SPKD's main goal: safety against flooding. This picture shows the Meuse in 1995 after flooding. (Source: WL | Delft Hydraulics 2007)

Another example is the spatial quality. Spatial quality is explained in this SPKD by the terms utility value, experience value, and future value. The utility value is high when space can be used in a safe manner for different functions, when these functions do not hinder each other, strengthen each other if possible and are accessible to all population sections (equity). Experience value plays an important role in the (living) environment. This involves cultural awareness and diversity, human standard, presence of characteristic identification marks/landmarks (identity) and readability of (cultural) history and beauty. Also, in this context one should think of spatial variation. Future value is about sustainability, biodiversity, solidness, adjustment and flexibility in time, concerning suitability for new methods as well as openness for new cultural and economic purposes.

One may wonder why spatial quality relates to the social component then. This can be explained by the way it has been defined in this SPKD. Namely, the three terms mentioned in the previous paragraph all take a social or human-centred (anthropocentric) view. Utility value and experience value are obvious. The first relates to how space can be used by humans

and whether this is accessible to them; the latter relates to experiences, such as cultural awareness, human standard and identity. Future value at first glance seems less social, but since terms such as sustainability and biodiversity are put in the light of new cultural and economic purposes these are also rather social.

This also becomes obvious by the related criteria selected for the social component. First of all, utility value can be explained in terms of resource consumption. Secondly, experience value relates to a certain sense of "neighbourhood". However, this is not the only criterion it relates to. Also, experience value as defined above can add to the life satisfaction and happiness of humans, but also to the liveability of the environment humans live in. This can subsequently improve the mental well-being of humans. Furthermore, experience value has a link with beauty. As discussed in subsection 3.1.1, when an object is beautiful it delights the senses and/or exalts the mind. In this sense beauty has a strong link with health, and more specifically mental well-being. Namely, beauty is something that can influence the earlier mentioned criteria such as happiness and liveability, and therefore also the mental well-being, of humans. Given the fact that the emphasis is on security and that utility value, experience value, and future value take on a human-centred point of view, it can be concluded that these are anthropocentric characteristics.

4.1.2 Water Quantity

It becomes obvious from subsection 4.1.1 that water quantity issues also take in an important position in the SPKD *Room for the River*, which also relates to safety. As mentioned in 4.1.1 the higher normative drainages, established in 2001, require measures. These measures are necessary in order to drain off the extra quantity of water through the rivers. The cabinet chooses a whole new approach for safety against flooding in which they use measures that provide more space for rivers and prevent high water levels.

The rising sea level has consequences for the opportunity to drain off water of the Ijsselmeer to the sea by free fall. The water level of the Ijsselmeer has to rise, which has an effect on the normative drainages for this lake and therefore also on the lower reaches of the Ijssel. In this SPKD it is assumed that by doubling the drainage capacity of the Afsluitdijk, the Ijsselmeerlevel can be maintained the next decennia (Figure 4.1.2). After that the Ijsselmeer will rise with the sea level. This means that a rise of 20 centimetres of the normative high water level in the Ijssel's mouth has to be taken into account in the course of this century.

Figure 4.1.2 The drainage capacity of the Afsluitdijk has to be doubled (Source: Ezelsbruggetjes 2007)

In the SPKD *Room for the River* it is described that water storage will not be brought into action for the short-term. At this moment there is insufficient support for this measure. The cabinet's opinion is that there are enough other types of measures available to realise the required safety against flooding.

It is pointed out that the possibilities for and consequences of widening rivers are different for each river branch. For example the dikes of the Lek are located directly at the riverbanks. Therefore river forelands are not there or only very small. This means that river widening by lowering river forelands is not or hardly possible. When deepening the summer bed along the Lek, the stability of the dikes at several stretches may need to be improved. Dike improvement along the Lek is not impossible, but does ask for cunning solutions. For great distances buildings are close to or lie against the dikes. These dikes have been built in an environment with a weak soil, namely peat. Compared to the Waal and Ijssel, measures for the Lek especially cause big problems for the long-term. That is why it has been decided to drain off the extra water, meaning everything above 16.000 cubic metres per second, through the Waal and Ijssel. This way the Neder-Rijn/Lek will not have to deal with extra drainage. This will be realised by building a regulatory works at the Hondsbroekse Pleij.

Reservations

In relation to the water quantity component, the SPKD *Room for the River* also describes reservations. To ensure that it will be able to take measures for the short-term, areas have been reserved for these measures. These areas are guarded from developments that can hinder arranging them for the protection against flooding. However, rights that are in force, such as for construction, remain valid. Based on this national policy, regional governments are asked not to address new rights that are contradictory to the abovementioned reservations.

In this SPKD it is argued that an important function for drawing up a long-term vision with an indicative set of measures is that it should point out clearly which inner dike areas should remain available in the future in order to be able to meet the objectives for the long-term.

Based on the aforementioned it becomes clear that water quantity issues take in an important position in the SPKD *Room for the River*. Every criterion selected for this component – whether it is about floods, droughts, water storage, drainage or creating more space for water – is discussed to a greater or lesser extent. Therefore, it can be stated that these are anthropocentric characteristics, especially given the fact that the aim is providing safety.

4.1.3 Institutional

A number of institutional aspects of the SPKD *Room for the River* are discussed in this subsection. These can be for instance amendments, plans, frameworks and so on (see also Table 2.2).

Space Amendment

The Space Amendment (Nota Ruimte) is for the cabinet the initial concept for giving direction to the improvement of spatial quality in The Netherlands. The area of the main rivers, the subject matter in the SPKD *Room for the River*, is also part of this amendment. This area is important, both from the national perspective as well as the international. Nationally it is part of the Spatial Main Structure (Ruimtelijke Hoofdstructuur) and internationally the area is significant for the economy, ecology and landscape.
In the Space Amendment the following objectives have been formulated for the area of the main rivers:

- increase of the spatial diversity between the river branches
- preservation and reinforcement of the open character with the characteristic waterfronts
- conservation and development of the landscape, ecological, geographical/geological and cultural historical values and the improvement of the environmental quality
- reinforcement of the possibilities of the usage of main water infrastructure by commercial and recreational boating

National Spatial Framework

For the scope of this SPKD, national policy has been translated into the National Spatial Framework (Nationaal Ruimtelijk Kader). In this framework, courses and accompanying core issues for the spatial development have been formulated for different (sub)areas in the river area. The National Spatial Framework considers the river area from its meaning for the Spatial Main Structure of The Netherlands. Furthermore, the different river stretches are characterised by their specific core qualities.

Scenarios

In order to translate the national objectives into a long-term vision, different scenarios have been drawn up. Each of these scenarios provides a possible development direction. The cabinet chooses a combination of elements from these scenarios. The scenarios mentioned in the SPKD *Room for the River* are:

- Beads on the cord (Kralen aan het snoer)
- Old and new river tracks (Oude en nieuwe rivierlopen)
- The widened river ribbon (Het verbrede rivierlint)

Regional Spatial Framework

In order to give a more concrete form to the objective spatial quality, a process coherent with the combined scenario was followed by which the Regional Spatial Framework (Regionaal Ruimtelijk Kader) has been drawn up. The Regional Spatial Framework originates from combining information from the national and local level at the regional level. Opportunities are mentioned and development directions are explored with regard to desired land use and functions that should be realised in the river area.

Programmed Approach

In this SPKD a so-called programmed approach is used. The programmed approach stands for maintaining flexibility. The cabinet has mentioned in the Space Amendment that it sets great store by regional development capacity. The flexible character of the programmed approach is revealed by the fact that at several locations a choice can still be made between measures of the basic set of measures and alternatives that hold prospects.

Also, additional measures have been entered in the SPKD *Room for the River*. The cabinet's opinion is that there should be room for other measures than the ones mentioned in this SPKD or for new insights and techniques/methods in order to achieve a better realisation of the objectives or because other measures are socially more accepted. The programmed approach also provides the opportunity to accommodate future developments in the SPKD *Room for the River*.

The basic set of measures in this SPKD contains measures that can be executed anyhow within the available budget. The alternatives relate to measures with a broader perspective for the region. At some locations one or more measure(s) from the basic set of measures can be replaced by these alternatives. Additional measures are not directly necessary in order to realise the safety objective. However, as far as it concerns the long-term goal, these should contribute to the safety objective.

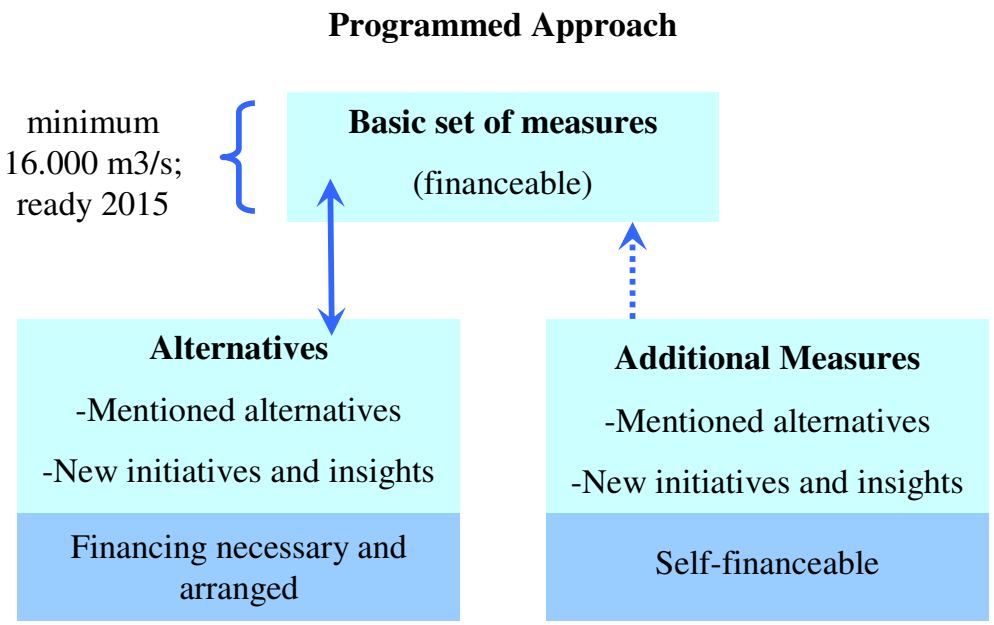

Figure 4.1.3 Programmed Approach (Source: Programmadirectie Ruimte voor de Rivier 2007)

Flexibility in the future

The cabinet does not rule out that new initiatives (alternative, additional measure, or alteration of land use/type and location of measure) will be presented in the following years, for instance when there are new insights or when new techniques have been developed, which leads to a better achievement of the objectives. It is also imaginable that these initiatives can lead to lower costs. Some initiatives can also add to realising other objectives such as the extraction of minerals and the deposition of surplus soil. The success or perspective of such initiatives depends in a lot of cases on local public-private partnership and the willingness to link safety to other river-bound functions, with which an improvement of spatial quality is also realized next to increasing safety.

Finally, there are also a number of other items mentioned in the SPKD *Room for the River* that relate to the institutional component. First of all, the SPKD policy will be used as a test-framework for the abovementioned initiatives. This means that they can be realised if the financing has been arranged and the necessity of these measures, in relation to the desired protection against flooding and improvement of the spatial quality and the coherence with the other measures and the soil balance, is definite. Secondly, the cabinet will also stick to the obligations of the strategic Environmental Impact Assessment (EIA) and execute the test concerning the protection of nature. Thirdly, the alternatives, additional measures and new initiatives have to fit in the Policy Direction Large Rivers (Beleidslijn Grote Rivieren). Also, within the duration of this SPKD, two successive phases can be distinguished:

- In the first phase (2006-2008) there is room for initiatives that can lead also to shifts in the set of measures, provided that they fit within the long-term vision and the available finances.
- In the second phase (2009-2015) there will be hardly any room for shifts in the set of measures, given the fact that in this phase the main point is the actual implementation of the river widening measures. The second phase (the implementation phase) will cover the largest part of the duration of this SPKD.

Furthermore, criteria for the assessment of alternatives, additional measures and new initiatives are pointed out. These can be found on the next page in Box 4.1.1.

Soil Excavation
Another important item in the SPKD *Room for the River* involves soil excavation. Namely, the measures in the basic set of measures bring along a lot of soil excavation. Part of the soil that becomes available in one measure could be re-used in the other or possibly put on the market for projects outside the basic set of measures *Room for the River*. During the planning of the implementation, the material that becomes available should be linked as good as possible to where material is needed (create work with work). Where this is not possible, other solutions will be searched for. For the soil excavation along the rivers, the area-oriented policy Active Soil-management Riverbed is worked out further in the policy regulations Active Soil-management Rhine-branches and Meuse (ABR/ABM). This policy will be implemented with the Rules of the Game ABR/ABM. In the SPKD these rules have been applied to the soil balance of the basic set of measures. For the lower river area, the ABR/ABM is not applicable. For this part of the river area the area-oriented policy has been worked out in the Cleaning Up Vision Lower River Area.

Except the statement that the measures creating more space for water also offer opportunities to support ecological, cultural historic, landscape and recreation values in order to maintain these values in a sustainable way or improve them, there are not a lot of ecocentric characteristics. Perhaps also the increase of spatial diversity between the river branches and the abovementioned about *soil excavation* – i.e. soil re-use and create work with work. Other than that the institutional component displays a lot of reductionist thinking with its artificial schemes. There is not an obvious move away from this, as is the case with the river basin approach in the WFD. Also, the criteria for the assessment of alternatives, additional measures and new initiatives described in Box 4.1.1. are obviously anthropocentric. Therefore, overall it can be concluded for the institutional component that the SPKD *Room for the River* is rather anthropocentric.

For the assessment of the alternatives, additional measures and new initiatives the cabinet uses the following criteria, both for the already mentioned as well as the future opportunities and developments:

Safety
The initiator has to point out that the realisation of the project will lead to the desired lowering of the water level. When there are different opinions on this, a second opinion from a professional organization, agency or firm (of consultants) could be asked for. If the project results in adjustments to main water works, the corresponding water board will have to test the civil-technical safety.

Time
The initiator has to make sure that the project application is accompanied by a realistic planning, based on the judgment/opinion of an administrative regional consultancy, which shows that the project can be realised in time. As far as zoning alterations are taken for granted by the project, it should have already been pointed out in a report by the municipality (or municipalities) concerned when it was submitted, that they are willing to cooperate.

Money
There should be certainty with regard to the question whether the realisation of the project is assured. The initiator will have to show, based on the opinion of the Ministry of Transport, Public Works and Water Management and based on a financial-economic estimate (in accordance with the PRI-systematics of the Ministry of Transport, Public Works and Water Management or similar and the accompanying quantified risks included), that the costs of this project are covered. In the event of doubt/when there is doubt, a second opinion of an independent agency can be asked for. In the event of an interchangeable measure, an admission can be submitted to the State Secretary of the Ministry of Transport, Public Works and Water Management for additional financing from the budget for *Room for the River*. The amount of money for this additional financing should basically not exceed the amount of money necessary for the measure it replaces.

Spatial Quality
Projects have to be tested by the 'masterplan', a plan that has to be drawn up for each route/stretch. When this is still absent it should be tested by the Regional Spatial Framework. With respect to the interchangeable projects, regarded as such in the SPKD, it can be stated that they already comply with the abovementioned. New alternatives will have to be tested by this framework.

Test by the Long-term Vision
Projects have to be tested by the long-term vision in order to prevent that investments will be made which have to be rectified on the long-term, or become redundant.
After an alternative has been entered in the basic set of measures of the SPKD, it can still turn out that a timely implementation of the alternative, necessary to achieve the safety objective in 2015, will not be reached. If that is the case, the original measure or cluster of measures, or another timely realizable, for instance more technical, alternative will be implemented in the river stretch in question.

Box 4.1.1 Criteria for The Assessment of Alternatives, Additional Measures and New Initiatives

4.1.4 Political

It is pointed out in the SPKD *Room for the River* that the cabinet wants to bring the protection against flooding at the required statutory level at the latest in 2015 and improve the spatial quality in the river area. Given the expectation that the normative drainages of the rivers will increase, the cabinet chooses to achieve the required safety level by taking measures which prevent these normative drainages to increase even further. This has led to a shift in emphasis from dike improvement to creating more space for water.

The planning process is not yet brought to an end. Currently, the separate measures are being drawn up. After this procedure the proposed measures can actually be implemented and will be completed, as stated above, in 2015. Furthermore, in the appendix of this SPKD it has been pointed out for each measure at which moment the final project decision should have been made. This way it also indicates the deadline when exchange with other projects is no longer possible.

Based on the improvement of the spatial quality in the area measures are entered in the SPKD. This means that an alternative will be entered in the basic set of measures, only when it has been indicated sufficiently that it complies with the limiting conditions (see Box 4.1.1). The cabinet does not want to rule out the possibility that the final decision on this will be made after the establishment of the SPKD, because the measure is very complex since it has to be integrated with other spatial developments. In these cases there has to be sufficient sight on the financial coverage of the measure.

An additional measure can only be entered in the SPKD when the financial-economic and technical feasibility have been determined. From a technical point of view, the measure has to be solid, particularly in a hydraulic and morphological sense. Furthermore, the measure has to be self-financable and risk-neutral.

The Minister of Transport, Public Works and Water Management can make the decision for a new initiative or insight, which deviates from the SPKD, in accordance with the Minister of Housing, Spatial Planning and the Environment.

Eventually the cabinet determines which choice (measure of the basic set of measures versus alternative measure) is sensible within the objectives and the limiting conditions (see Box 4.1.1).

Another aspect mentioned in this SPKD, which relates to the political component, is participation. As discussed above separate measures are being drawn up. It is stated in the SPKD *Room for the River* that public participation is possible with these measures. Also, the integrated approach considering safety ánd spatial quality offers opportunities for areas where adjustment or renewal is necessary in that other spatial developments and initiatives can be linked to or combined with it. In those situations, other governmental organisations (such as provinces, municipalities and water boards), private organisations, social groups, and private owners also have an important role and responsibilities.

The measures, alternatives, additional measures, and new initiatives in order to achieve the required safety level are assessed and chosen based on the criteria described in Box 4.1.1. As already discussed these are rather anthropocentric. For instance an alternative will only be entered in the basic set of measures when it complies with the limiting conditions such as time and money.

4.1.5 Technical

In subsection 4.1.4 it has been discussed that there is a shift in emphasis from dike improvement to creating more space for water. Dike improvement is only applied to stretches where creating more space for water is not possible or when given the total task the costs are too high. Otherwise, measures are used that create more space for water and thus prevent high water levels. Dikes and dike improvement are a symbol of technical oriented water management in The Netherlands. On the one hand there is a move away from such an approach. On the other, obviously dikes and dike improvement remain necessary in a country where two-thirds of its population lives in areas that would be flooded without these primary barriers and their maintenance.

Figure 4.1.4 Necessity of dikes and dike improvement (Source: Red Geographics 200X)

Figure 4.1.5 Areas below sea level or vulnerable to flooding, either by sea or by rivers, are displayed in blue (Source: Wikipedia 2007)

Another aspect relating to the technical component is the already discussed drainages. Based on the current insights, ongoing climate changes could lead to even higher drainages in the river system in the future. The cabinet takes into account a maximum drainage of 18.000 cubic metres per second for the Rhine and 4.600 for the Meuse; and besides these drainages a sea level rise of 60 centimetres.

For the SPKD *Room for the River* assumptions are made based on the so-called middle scenario of the Intergovernmental Panel on Climate Change (IPCC), which involves a temperature increase of two degrees Celsius per century. Based on this scenario the Royal Netherlands Meteorological Institute has calculated that precipitation will increase in the

Rhine- and Meuse river basins in the course of the twenty-first century, especially in winter. For the annual maximum of the ten day winter precipitation sum, an increase of the precipitation volume of 20 percent is expected. Based on a study of the international Commission Hydrology Rhine in 1997, this has been translated into an increase of the normative drainage of the Rhine, which has increased to 18.000 cubic metres per second. For the Meuse it is assumed that the expected increase in precipitation will lead to a normative drainage of 4.600 cubic metres per second. Also, other more recent international studies show that an increase of the extent and frequency of high-water in North-western Europe has to be taken into account. Assuming the same middle scenario of the IPCC, a relative sea level rise of 60 centimetres can be expected in 2100.

High-water levels (Dutch: toetspijlen), which are water levels which can be safely kept out, are linked to the normative river drainages. This means that an increase of the normative drainages also has consequences for the high-water levels.

Based on the fact that uncertainties are taken into account and that the so-called middle scenario of the IPCC is used, it can be argued that this implies that there are some ecocentric characteristics. Namely, humans fail to notice some impacts because they are not detectable by our ordinary senses. It is impossible for human beings to fully understand biospherical processes, which is ecocentric.

4.1.6 Financial and Economic

The financial consequences of the SPKD *Room for the River*, an obvious anthropocentric characteristic, have been pointed out clearly in accordance with the Procedure Regulation Large Projects (Procedureregeling Grote Projecten) established by the Dutch Lower Chamber. This is worked out in the Control Model (Dutch: Beheersmodel) Ministry of Transport, Public Works and Water Management, which has been made specific for *Room for the River* in the Control Plan (Beheersplan) *Room for the River*.

The accompanying way of estimating is known as the PRI-systematics. In Dutch, these letters stand for Project Ramingen Infrastructuur, which means Project Estimations Infrastructure. Part of this systematics is that next to an estimate of the costs, also risks are pointed out and a partly interdependent item called Unforeseen (Onvoorzien). The risks are qualified and entered in a risk-register, but also as much as possible quantified and taken into account for the costs. Risks that cannot be quantified (and are therefore not considered for the costs) are entered in the list Excluded Risks (Uitgesloten risico's). Also an uncertainty margin will be calculated. In this SPKD many different (types of) measures and alternatives are being used. When comparing types of measures and alternatives and making choices between them, the following items have to be taken into account in an integrated way: estimate of the costs, uncertainty margins and risks. All three items have to be considered for a good comparison.

Budget

In the Budget 2006 of the Ministry of Transport, Public Works and Water Management the following amounts concerning the planning and implementation phase have been entered for the Implementation Program (Realisatieprogramma) *Room for the River*.

Since the Budget 2004 the project *Room for the River* has become a separate article in the Infrastructure Fund, initially IF 02.01.05 and as of 2006 article 16.02.02 (see Table 4.1.1).

Amounts in the Budget 2006 of the Ministry of Transport, Public Works and Water Management for the project *Room for the River*

State Budget (million euros including VAT)

	up to and including 2004	2005	2006	2007	2008	2009	2010	Later	Total
IF 16.02.02									
Up to and including SPKD part 4 and current projects planning phase	41	12	4	1					57
Implementation phase (SPKD and current projects)	13	50	2	26	100	207	254	1.509	2.162
IF 16.02.02	54	62	6	27	100	207	254	1.509	2.219

Table 4.1.1 Budget 2006 (Source: Programmadirectie Ruimte voor de Rivier 2007)

The costs that have been made to draw up the SPKD *Room for the River* and for the current projects fall under the item 'up to and including SPKD part 4 and current projects planning phase'. Several other projects (especially NURG-projects) are also part of the SPKD *Room for the River*. These are projects that are necessary for realising the safety objective. Most of these projects are not financed by the Budget for *Room for the River*, but by the budget for NURG-projects (Dutch: Nadere Uitwerking voor het RiverierenGebied).

An amount of 200 million euros (price level 2005), originating from a reservation in the Infrastructure Fund for emergency flood areas, has been added to the total amount mentioned in the table. Also, an amount of 100 million euros (price level 2005) has been added in order to cover the difference that turned out in SPKD part 1. At that time the cabinet decided that a difference of 100 million euros could exist between the estimate and the available amount of money as given in the Budget of the Ministry of Transport, Public Works and Water Management. The cabinet assumes that this difference can be paid for by means of European subsidies and project bound income.

Within the programmed approach it has been mentioned that there are several alternatives. The possible extra costs will have to be financed by other private and/or public sources. This also applies to the measures (opportunities) that will be executed in a later stadium in order to improve the spatial quality in the planning area from a regional development perspective.

Estimate

The estimate of the costs consists of different components. The amounts in the estimate are based on the price level of 2005. In accordance with the PRI-systematics possible money making effects such as (extra) benefits and/or exploitation profits have not been taken into account. The costs of management and maintenance have not been taken into account in the estimate of costs, but are described separately. However, these costs do play a role when considering the interchangeable measures. Social benefits have also been left aside.

Now a short description of each component in the estimate of costs will be provided. The first component relates to investment costs. The following investment costs are distinguished:

- Standard estimate for each measure relates to investments costs minus investment profits. This also involves the quantified risks of the measures. The costs of the (further) execution of the planning phase and realisation phase have also been included. These are especially costs relating to personnel.
- Projectunforeseen (technical)
- Projectunforeseen (administrative choices)

After the completion of the SPKD-procedure, planning studies have to be implemented at project level and possibly several m.e.r.-procedures have to be completed before the measures can be implemented. In the estimate of the costs it has been taken into account that there are still planning studies that have to be done in the future.

The second component is the use of an uncertainty margin. Based on the PRI-systematics an uncertainty margin will be calculated that fits the phase in which the project *Room for the River* is at that moment. In this SPKD the uncertainty margin is +/- 37 percent of the total amount. This margin can be either positive or negative and is defined as the range, with a succession rate of 68 percent, where the eventual costs of the project *Room for the River* will fall within. The margin should be projected on the total, not on the different components of the estimate.

The third component relates to investment. The costs of the realisation of the measures, as pointed out in the basic set of measures, have been estimated and add up for each river stretch to the (rounded) amounts mentioned below. These investment amounts also encompass the costs of the (further) execution of the planning phase and implementation phase of the measure.

Estimate of the Basic Set of Measures

Stretch with accompanying measures	**Estimate (PRI)** Euro, price level 2005
Branching area: Upper-Rhine/Waal (up to and including Nijmegen), Pannerdensch Canal and Lower-Rhine (up to and including Arnhem/sluice Driel), Ijssel until the bridge in the A12 (including Hondsbroekse Pleij)	414
Waal (from Nijmegen until the A27 near Gorinchem	117
Lower river area from Gorinchem and Heusden until Delta Works (including Zuiderklip)	579
Lower-Rhine (from Arnhem/sluice Driel) and Lek	173
Ijssel	496
Subtotal	**1.779**
Administrative choices	221
Projectunforeseen (technical)	163
Total	**2.163**
Up to and including SPKD part 4 and current projects planning phase	57
Total estimate	**2.220**
Uncertainty margin (+/- 37 percent)	+/- 821

Table 4.1.2 Estimate of the Basic Set of Measures (Source: Programmadirectie Ruimte voor de Rivier 2007)

The costs of drawing up the SPKD and of the current projects should be added to the amount of the estimate. This is an amount of 57 million euros, which brings the total estimate at 2.220 million euros.
With an uncertainty margin of 37 percent the range is as follows:

Uncertainty margin	Lowest value	Estimate	Highest value
37 percent	€ 1.399 million	€ 2.220 million	€ 3.041 million

Table 4.1.3 Range (Source: Programmadirectie Ruimte voor de Rivier 2007)

The fourth component is the estimate with regard to the budget. The available budget is 2.219 million euros based on the price level of 2005. The total estimate is 2.220 million euros, including an adjustment to the price level of 62 million euros (approximately three percent). As pointed out earlier, the cabinet had decided that a difference of 100 million euros could exist between the estimated and the available amount of money; because it assumed that this difference could be paid for by means of European subsidies and project bound income. One million euros will now be added to this amount. In order to have this money at their disposal, the cabinet recognizes two possibilities. The first is that of European Structure Funds, in which Water Management is an important subject. The second is that of the continuation administrative choices. The cabinet assumes that in the future course, after the SPKD-procedure, the remaining administrative decisions will be made in order to manage and respectively lower the related costs. Obviously the opposite applies to the positive chances/opportunities.

The final component relates to management and maintenance. The costs of these have been estimated at 179 million euros. This amount is based on extra costs on top of the existing costs of management and maintenance, leading to average costs of 7,3 million euros annually. How these costs have to be covered for the period after 2015 still has to be found out. In accordance with the PRI-systematics, an uncertainty margin has not been calculated for these management and maintenance costs. Nevertheless, the uncertainty margin is still high under the circumstances of the phase and is estimated at +/- 60 percent. The risks of management and maintenance have been entered qualitatively in the risk register.

Risks
It is pointed out in the SPKD *Room for the River* that the risks that could come to the fore in the further planning phase and implementation phase of the project have been qualified as good and complete as possible and entered in a risk register. Knowledge and experience of comparable large infrastructure projects has been used for putting up the risk register. Control measures have been linked to the risks in order to make sure that the chance of the occurrence of a risk is as low as possible and – if the risk occurs – it can be controlled as good as possible.

The risks have been quantified as much as possible. The risks that were not quantified have not been considered in the estimate of the costs, but have been entered in the list excluded risks. For the risks that have been quantified, a distinction has been made between risks at measure level and risks at project level. The former are covered by the standard estimate for each measure. The latter exceed the measure level and are estimated based on the *risk x consequences* principle. The risks at project level have been split up in projectunforeseen (technical) and projectunforeseen (administrative choices).

Projectunforeseen (technical) encompasses risks that relate to technical implementation matters and risks that can be controlled at an effective (technical) project management level.

These risks add up to an amount of 163 million euros (risk x consequences) and have been incorporated in the investment costs. Projectunforeseen (administrative choices) encompasses risks that influence the project *Room for the River*, but of which the auditor has determined that the choice and implementation of corresponding control measures lies outside of the project organisation's influence.

Administrative Choices
The administrative choices category adds up to a total amount of 221 million euros. This amount remains uncertain for the present. A number of administrative choices, including the corresponding control measures and financial consequences, have been acknowledged. For instance an amount of 25,3 million euros is involved for integrating the EU directive concerning groundwater.

Auditor
Since the summer of 2003, an independent auditor has been established to see to it that there is compliance with the valid standards and that the results of the planning process are accurate. The basic principle of this is that every mutation to an earlier approved estimate (including margins and risks) has to be judged by the auditor based on plausability and accuracy. This activity will continue, also during the next planning phase after the SPKD has become valid. The project organisations will collect all temporary mutations and, after approval at fixed measure moments (peilmomenten), incorporate these in the estimates. This way the different versions of the estimates remain comprehensible and it is possible to make comparisons between the dates at which the fixed measure moments (peilmomenten) took place.

4.2 Ecocentric Perspective

Now the same will be done for the Spatial Planning Key Decision (SPKD) *Room for the River* from an ecocentric point of view. This means that the ecocentric characteristics of the SPKD *Room for the River* are investigated based on the framework – i.e. components and criteria – provided in chapter two.

Quality Conservation

The quality conservation of the project *Room for the River* has received a lot of attention. A control plan has been drawn up in which the necessary actions for guaranteeing the quality of the SPKD *Room for the River* are laid down. It should be taken into account in which phase the project is. The Audit Committee *Room for the River* has – in accordance with the control plan – determined an audit programme. This will be adjusted and realised periodically based on earlier experiences and results. By means of re-audits it will be determined to what extent earlier recommendations are followed. In a (strategic) planning process of this extent, accentuations and improvements can be made based on new insights and ongoing realizations.

4.2.1 Water Quality

EU Water Framework Directive

The WFD, which entered into force on 22 December 2000, prescribes that Member States should in general protect, improve and/or restore all waters in order to achieve good status in 2015. The rivers in The Netherlands have been characterised as heavily modified bodies of water. This means it is a matter of so-called hydromorphological interventions (dikes, dams, sluices, and so on) and that achieving the good status which belongs to a completely natural situation is not feasible. The objectives for this category of waters have to be formulated in 2009 in terms of good ecological potential.

Figure 4.2.1 and 4.2.2 Heavily modified bodies of water in The Netherlands
(Source: Rijkswaterstaat 2007)

According to the WFD it has to be investigated whether the hydromorphological interventions can be made undone completely. Obviously dikes and dams are essential for among other things safety, shipping and freshwater management/control. This will be explained in the river basin management plan (2009). In this concept management plan will also be described how the official WFD objective 'good ecological potential' has to be defined and which mitigating

measures are necessary to achieve this objective. The WFD's goal is to achieve an internationally adjusted water management based on river basins. The Netherlands will profit from this since it is a delta, the end of a river basin. Upstream reduction of pollution will in general lead to cleaner sediment and cleaner water. In general it can be stated that creating more space for rivers will to a large extent contribute to the ecological recovery of rivers. The decision making process for the Rhine branches, within the scope of this SPKD, forms the basis by realising morphological measures in the river basin management plan 2009-2015. The aim of further development and implementation of the different projects, within the limiting conditions of the SPKD, will be a further optimalisation of the contribution to the WFD's objectives.

Soil Balance and Deposits for Soil
Part of the surplus of soil is polluted. Namely, the mud flats in the river and the top layer of the river foreland have become polluted in the course of years due to the river water which was heavily polluted in the past. If such soil is excavated when executing measures this will lead to a polluted groundstream and thus influences the quality of the water. Soil that becomes available from the river system, including the areas that become outer-dike areas, is defined in regulations as mud cement. The dredging or excavations of and the application or storage of soil from the summerbed or the river forelands is subject to European and National policy, as pointed out in 4.1.3.

Based on the aforementioned it can be stated that these explanations are ecocentric. First of all, this becomes apparent by the description of the WFD that Member States should protect, improve and/or restore all waters in order to achieve good status. Secondly, by the special attention to groundwater pollution due to excavations aimed at creating more space for water.

4.2.2 Biological

In the SPKD *Room for the River* it is pointed out that in general it can be stated that creating more space for rivers contributes to a large extent to the ecological recovery of the rivers. For instance, the measures creating more space for water also offer opportunities to support ecological, cultural historic, landscape and recreation values in order to maintain these values in a sustainable way or improve them. This is also indicated by the effect of the Space Amendment on the SPKD *Room for the River*. As already discussed in 4.1.3, two of the objectives of the Space Amendment formulated for the area of the main rivers are:

- increase of the spatial diversity between the river branches
- conservation and development of the landscape, ecological, geographical/geological and cultural historical values and the improvement of the environmental quality

Except for the cultural historical values, all other items, whether it is spatial diversity or the conservation of ecological values, relate to the biological component. Obviously, these are also a prerequisite for the Habitat component. For instance, spatial diversity is important for different living environments. An aspect closely related to this is the use of the river basin approach. In this SPKD, a division into different river stretches is applied. Instead of a man-made/institutional division, this is a division into more natural, or biological, units. Although the abovementioned examples are ecocentric, the biological component is not as obvious as in the WFD. For instance, an important criterion such as ecological interconnectedness is underexposed.

4.2.3 Habitat

As part of the SPKD *Room for the River*, a Strategic Framework Birds Directive and Habitats Directive has been formulated. In this framework it is explored which Natura 2000 values are relevant for the river area, but also how safety and nature can go hand in hand. Nearly the entire outer-dike area of the Rhine branches and the lower rivers (benedenrivieren) is designated as Special Protection zone in the scope of the Birds directive. Also, a number of areas have been designated as Special Protection zone for the Habitats directive. River widening in the outer-dike area can in many cases go hand in hand with nature development. However, existing values do need to be taken into account. This way several areas have been given the status 'Blijf af' (Keep off), which means that for instance lowering forelands is not allowed. Also, the river forelands have an important forage function for geese, swans and other water birds. The total forage function should be maintained. The birds and habitats directives are only applicable to a few inner dike areas. These are Rijnstrangengebied, the Biesbosch and several areas in the Biesbosch's surroundings such as Steurgat and Zuiderklip.

Figure 4.2.3 and 4.2.4 Existing values need to be taken into account: forage function of river forelands (Source: Stichting Natuurdichtbij 2007 and Ministerie van Verkeer en Waterstaat 2007)

Nature conservation

The Dutch river area is of importance to Natura 2000. Natura 2000 involves the conservation and development of a European network of nature reserves. Over 70 percent of the entire outer-dike area of the Rhine branches and the lower river stretches has been designated as Special Protection Areas (Speciale Bescherminszone SBZ) as part of the Bird Directive. Besides, there are also areas listed on the Community list for Special Protection Areas, laid down by the European Commission in December 2004, as part of the Habitat Directive. These areas, which accommodate unique living environments (habitats) and plant- and animal life, still have to be designated as Special Protection Areas by The Netherlands.

After the SPKD part 1 came out on 1 October 2005 the Nature Conservation Act 1998 became valid. This law, among other things, lays down rules for the protection of Special Protection Areas. All relevant regulations of the Bird and Habitat Directive have now been translated into national legislation. The regulations regarding species protection had already been translated into national legislation earlier when the Flora and Fauna Directive came into force. For the decision making, as part of this SPKD, not primarily the Bird and Habitat Directive is of importance, but also the national legislation for nature conservation.

The set of measures that the cabinet has chosen for this SPKD was put to a suitable assessment on the global level, as laid down in the Nature Conservation Act 1998. Verification of the regulations of the Flora and Fauna Directive was not significant for the

establishment of this SPKD, because more detailed information about the way of implementing the measures would have been necessary for that. However, when the measures will be developed into design plans, verification of the regulations of the Nature Conservation Act 1998 and the Flora and Fauna Directive will be under discussion (again).

Suitable Assessment at Strategic Level

In order to find out whether there are significant effects of the proposed measures on the conservation objective concerning Bird and Habitat Directive areas, a suitable assessment has been executed at the strategic level of this SPKD in line with the Habitat Directive. The suitable assessment has been integrated in the Environmental Impact Assessment (EIA) *Room for the River*, but also has an independent status. Only the location and the type of the measures have been laid down. On behalf of the EIA and the suitable assessment, designs of the measures have been drawn up. After the SPKD, when the measures will be implemented, a final assessment will be executed as part of the Nature Conservation Act 1998.

The suitable assessment complies with the regulations laid down in the Habitat Directive and the Nature Conservation Act 1998. As part of the suitable assessment, only the possible negative effects of the measures have been taken into account (as legislation demands). These are considered in relation to achieving the conservation objectives.

In the EIA, the consequences for Natura 2000 also make up for one of the criteria. Furthermore positive effects of the measures, which fit in the task for improvement of Natura 2000, have been taken into account. The results of the suitable assessment of the set of measures in the SPKD are guiding for the further optimization of measures in the phase after the establishment of this SPKD. This way, violations of protected nature values can be avoided as much as possible and chances for improvement of Natura 2000 can be seized.

Conservation Objectives

For every Special Protection Area, the Minister of Agriculture, Nature and Food Quality has the obligation to formulate objectives for the conservation of the Special Protection Areas. These objectives make up the framework for the suitable assessment. For the planning area of *Room for the River*, these will be developed in accordance with the Strategic Framework Bird and Habitat Directive. In this framework current resolutions in which the Bird Directive areas are designated and the species and habitat types for which the Habitat Directive areas are reported to the European Commission have been taken into account.

Strategic Framework Bird and Habitat Directive

In the Strategic Framework it is described which current Natura 2000 values in the entire river area are of importance and should be conserved. The Strategic Framework encompasses the following two important elements:

1. Current nature values
   The ‘Keep off’-principle is directed at the conservation and restoration of a number of habitats and species which are rare and/or bound to specific locations. On these locations it is not allowed to carry out measures and the effects of measures in the surrounding area should be taken into account critically in order to prevent negative effects.
   The ‘Pay attention’-principle is directed at areas that have a forage function for herbivorous water birds, such as geese and swans. The extent of forage areas in the river area as a whole must be conserved. Measures are possible provided that the key factors tranquillity, openness and sufficient availability of food will be maintained.

2. Task for improvement
   For the river area as a whole – which means not only for the Special Protection Areas – it has been pointed out from the Natura 2000 point of view how the nature values can be improved. This has been described for each river branch.
   In order for the integrated approach of Natura 2000 to have a good effect on the river area, as laid down in the Strategic Framework, it is desirable that the different river branches altogether will be considered as one Special Protection Area.

If possible within the limiting conditions (time and money) of the project, measures with a positive effect on Natura 2000 have been chosen. As a result of (public) participation, legal advice and further research, the basic set of measures has been altered at certain points. In a number of cases other variants of measures have been entered in the basic set of measures. The suitable assessment of the set of measures has been carried out at three levels: the level of the total basic set of measures for each river branch, but also for each Special Protection Area, and for each measure separately.

Cumulative Effects
Having possible cumulative effects in mind, it is important to realize that there are also a large number of other plans and projects in the river area which have to be considered; plans and projects as part of NURG and the provincial development of the Ecological Main Structure. The current projects which have been entered in this SPKD are a part of this. These plans and projects especially relate to the development of more natural, river-bound ecotopes at locations where currently agricultural grasslands are still present.

As a result of the implementation of the basic set of measures in this SPKD in combination with the other plans and projects, significant negative effects on wintering, grass-eating/herbivorous water birds cannot be ruled out. In this SPKD, measures have been laid down in order to undo the possible effects of the basic set of measures on wintering, grass-eating/herbivorous water birds at the level of the total river area.

In this SPKD it is also assumed that possible effects on other protected habitat types or species can be nullified by optimizing the design during the further development of the measures. In that case, possible accumulation of effects is not under discussion. If relevant, the suitable assessment at the level of design plans should also take possible cumulative effects into account.

The aforementioned clearly points out that there is also an emphasis on the habitat component in the SPKD *Room for the River*. Nearly the entire outer-dike area of the Rhine branches and the lower rivers (benedenrivieren) is designated as Special Protection zone in the scope of the Birds directive. Also, a number of areas have been designated as Special Protection zone for the Habitats directive. River widening in the outer-dike area can in many cases go hand in hand with nature development. However, existing values do need to be taken into account. This way several areas have been given the status ‘Blijf af’ (Keep off), which means that for instance lowering forelands is not allowed. This way the biological criterion *Protection of flora and fauna* is also taken into account. It can be cocluded based on the aforementioned that the SPKD *Room for the River*, when considering the habitat component, is ecocentric.

4.3 Summary

In this section, the main findings of sections 4.1 and 4.2 are summed up. First of all, the most striking anthropocentric characteristics of the Spatial Planning Key Decision (SPKD) *Room for the River* will be discussed and subsequently the most striking ecocentric ones. Obviously, the most striking anthropocentric characteristic is reflected by the main goal of the SPKD *Room for the River* that safety must be in accordance with the normative drainages at Lobith and Borgharen, concerning the Rhine and Meuse respectively. The importance of water quantity – in terms of drainage, more space for water (floods and droughts), safety against flooding, and (land) reservations – and spatial quality – in terms of utility value, experience value and future value – are anthropocentric characteristics. The fact that measures, alternatives, additional measures, and new initiatives are assessed based on safety, time, money, spatial quality and test by long-term vision is also anthropocentric. Furthermore, there are a lot institutional arrangements and the financial consequences are described in detail, which are also anthropocentric characteristics.

The most striking ecocentric characteristics involve quality conservation, a strong presence of the habitat component, special attention to groundwater pollution due to soil excavation for creating more space for water, the important position of the Water Framework Directive (WFD), the Special Protection zones, and the fact that creating more space for water contributes to ecological recovery.

- 5 -

Conclusions

Currently, there is a lot going on in Dutch water management. As discussed, The Netherlands is facing new challenges in water management. In order to deal with these new challenges, the Dutch government chooses to create more space for water. To accomplish this, the Spatial Planning Key Decision (SPKD) *Room for the River* and the Water Framework Directive (WFD) are important policy documents. These documents seem to have a different focus. The former seems to focus on safety and water quantity issues, while the latter seems to focus on the protection of water, water quality and ecological issues. Two perspectives that correspond with this contradistinction are the anthropocentric and ecocentric perspective. The distinction between anthropocentrism and ecocentrism is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is – humans or nature. It has already been pointed out that it could be interesting to investigate what the differences are – in terms of anthropocentrism and ecocentrism – between the SPKD *Room for the River* and the WFD in order to find out whether the focus of these documents is on humans or nature, but also for achieving policy improvement and to contribute to achieving a (more) sustainable environment.
Therefore the following main research question was formulated:

To what extent are the Water Framework Directive and the Spatial Planning Key Decision *Room for the River* anthropocentric and/or ecocentric?

This study has been carried out based on an extensive literature study. A framework for examining and testing has been developed. Subsequently, the two policy documents WFD and SPKD *Room for the River* have been read and delved into based on the developed framework. Furthermore, secondary literature played an important role. Based on the aforementioned, clear differences – in terms of anthropocentrism and ecocentrism – have been identified and pointed out. This study presents these differences in a nuanced way. The differences are listed in tables 5.1 and 5.2.

In essence, the WFD is ecocentric. Namely, its ultimate aim is to achieve the elimination of priority hazardous substances and contribute to achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances. Next to a lot of other ecocentric characteristics, there are also a number of anthropocentric characteristics. Both are displayed in Table 5.1. It should be noted that these are not all the characteristics mentioned in chapter three, only the most striking.

Water Framework Directive	
Anthropocentric Characteristics	**Ecocentric Characteristics**
- Water as a heritage	- Water quantity subordinate to water quality
- Importance of water for the abstraction of drinking water	- River basin approach
- Grounds for exemptions	- Growing awareness of the impact humans have on the environment and that the success of the WFD relies on information, consultation and involvement
- Protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations	- Monitoring of water status
- Member states may phase implementation of the programmes of measures to spread the costs of implementation	**- Achieve the elimination of priority hazardous substances and contribute to achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances**
- If a body of water is so affected by human activity or its natural condition is such that it may be unfeasible or unreasonably expensive to achieve good status, less stringent environmental objectives may be set	- Protection of inland surface waters, coastal waters, transitional waters, and groundwater
- One of the conditions in order to achieve less stringent environmental objectives is based on *reason*	- Environmental objectives
	- Protected areas
	- Conservation of habitats and species
	- Combined approach: point and diffuse sources
	- Strategies against the pollution of water
	- Diversity principle

Table 5.1 Most Strinking Anthropocentric and Ecocentric Characteristics of The WFD Summarized

The fact that the WFD is ecocentric to a large extent can be dedicated to an internal conflict between the Council of Ministers and the European Parliament, but also to a successful environmental lobby via the EU Parliament, in which especially NGOs have brought distinctive strategic and scientific ideas into discussions at an early point (Kaika and Page 2003). Furthermore, "the increasing internationalization and complexity of water resource management, the increasing number of actors and institutions involved in this process, the newly vested economic interests in water supply, and the increasing concern and sensitivity towards environmental protection, are amongst the factors that made the political ecology of

water at the local, national, European and international levels more complex and important" (Kaika 2003, 299).

One characteristic mentioned in Table 5.1 requires some more explanation in that it indicates a serious pitfall to the success of the WFD. Namely, the *grounds for exemptions* to achieve good water status is a clause directed at *heavily modified bodies of water*. "It is estimated, however, that up to 90 percent of all the waters within the EU could be defined as heavily modified" (White and Howe 2003, 630).

In essence, the SPKD *Room for the River* is anthropocentric. Namely, its main goal is that safety must be in accordance with the normative drainages at Lobith and Borgharen, concerning the Rhine and Meuse respectively. Next to a lot of other anthropocentric characteristics, there are also a number of important ecocentric characteristics. Also for the SPKD *Room for the River* the most obvious characteristics have been summarized (see Table 5.2).

Spatial Planning Key Decision *Room for the River*	
Anthropocentric Characteristics	**Ecocentric Characteristics**
- Safety must be in accordance with the normative drainages at Lobith and Borgharen, concerning the Rhine and Meuse respectively	- Quality conservation
- Spatial quality in terms of utility value, experience value and future value	- Water Framework Directive takes in an important position
- Water quantity important: drainage, more space for water (floods and droughts), safety against flooding, (land) reservations	- Special attention to groundwater pollution due to soil excavation for creating more space for water
- Measures, alternatives, additional measures, new initiatives assessed based on safety, time, money, spatial quality and test by long-term vision	- Creating more space for water contributes to ecological recovery
- A lot of institutional arrangements	- Strong presence of habitat component; Special Protection zones
- Financial consequences described in detail	

Table 5.2 Most Strinking Anthropocentric and Ecocentric Characteristics of The SPKD *Room for the River* Summarized

In comparison with the WFD, the SPKD *Room for the River* is less anthropocentric than the WFD is ecocentric. To put it differently, the anthropocentric characteristics in the SPKD *Room for the River* are less prevailing compared to the ecocentric characteristics in the WFD. Although the WFD has some anthropocentric characteristics, the ecocentric characteristics in the SPKD *Room for the River* are more emphatic, especially those relating to the habitat component. This could be dedicated to an increase of European policy and regulation, but also to a growing awareness of the impact humans have on the environment.

Now that we know to what extent the WFD and SPKD *Room for the River* are anthropocentric and/or ecocentric – so we know what their anthropocentric and ecocentric characteristics are – it can be investigated what to do with this insight. This can lead to policy improvement. Questions that can be derived from this are for instance: What should the mix between anthropocentric and ecocentric characteristics look like? Or, how should these be filled in and tuned? How should (Dutch) decision makers/policy makers fit this in/implement this? What policy strategies can/should be developed? For instance, should it be more anthropocentric and/or ecocentric?

This is not the only relevance of this study. As already discussed, the dissension between anthropocentrism and ecocentrism is perhaps the most important way of understanding the relationship between human beings and nature, because this determines what the focus is – humans or nature. Therefore, it can also be argued that the framework used in this study shows that it perfectly lends itself to investigate what this focus is of the WFD and the SPKD *Room for the River*. On top of that, in a broader perspective, another aspect why the dissension between anthropocentrism and ecocentrism is relevant relates to sustainable development. When the anthropocentric and ecocentric perspectives are better tuned to each other this could add to achieving a (more) sustainable development. Therefore, insight into the extent of anthropocentrism and ecocentrism is necessary. In this sense the framework used in this study can also add to the achievement of a (more) sustainable development and ultimately a sustainable environment. In my opinion achieving a sustainable environment is rather a utopian dream. However, as Ursula K. LeGuin puts it strikingly: *It is good to have an end to journey towards; but it is the journey that matters in the end.*

As displayed in the conceptual model, the dissension between anthropocentrism and ecocentrism should be considered as a spectrum. Where the optimum lies in the spectrum differs from case to case, because this is context-related. While one case may require a more anthropocentric approach, the other might require a more ecocentric one. Naturally, safety issues, water quantity issues, water quality and ecological issues are all important. However, in general I advocate to reason from an ecocentric point of view with anthropocentric preconditions. Namely, nature deserves moral consideration because it has intrinsic value, value aside from its usefulness to humans; it can be valued for its own sake. We humans are part of a greater ecological whole.

As a reflection back to theory it can be argued that a totally ecocentric approach is not feasible, because (scientific) rationality and *reason* are always in play. Goals and intentions can be ecocentric, but the instruments will always be based on (scientific) rationality and *reason* which makes an approach anthropocentric. For instance, the intentions of the WFD are ecocentric, but handling and implementing this document has anthropocentric characteristics. Furthermore, the WFD is more ecocentric than the SPKD *Room for the River* which could indicate that at a more abstract level ecocentric intentions are feasible, but that the more practical level is already more anthropocentric. This is displayed by the anthropocentric characteristics of the WFD itself, but equally important by the fact that the SPKD *Room for the River* is more anthropocentric. Namely, the SPKD *Room for the River* is directed more at the execution and implementation than the WFD. In a sense this relates to the argument about goals and instruments stated above.

Therefore, in order to achieve policy improvement and a (more) sustainable environment, the "instruments" have to be made less anthropocentric. By this I mean for instance the move towards an approach based on a more natural (biological) division in the WFD – *the river basin approach*. A prerequisite is that the goals/intentions of policy should be ecocentric.

As a final statement I would like to say that we should cherish our world and its environment and it is our responsibility to always keep trying to achieve the end of a sustainable environment, although the journey towards it will probably never get us there.


NORTH
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