Universiteit Utrecht

Master thesis:

Introducing the Prism-concept

A strategy to boost the effectiveness of River Management Planning

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Justification

Introducing the Prism-concept
A strategy to boost the effectiveness of River Management Planning

Thesis

To obtain a Master's degree at the University of Utrecht
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By

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Born on October 8th, 1974
in Utrecht

Executive summary

Summarizing this research project; the initiative for the research project stems from the well-known problem of time overrunning during the implementation process of public works development – that comes down to an efficiency issue within the planning process – the focus of this specific project however, was on River Management Development. The reason for this focus stems from the fact this project was assigned by the Köln based Hochwasser Kompetenz Centrum (HKC), who noticed serious challenges for to the planning process of river management development with regard to implementation time. A time consuming process of the development of thirteen floodplains along the *Rhine* catchment area has been the trigger for research (appendix A, pp.73-74). So the initiating challenge for this project started with the question *"Why it is so troublesome to arrive at water tasks like the ICPR-assignment"*. Finding an answer to that specific question is not too difficult, as most stagnation in public work planning processes suffering from an absence of cooperation of the landowners and stakeholders. So based on that answer the factual research problem underlying this project emerged. In broad sense, the problem for planning can be described as: "*The lack of cooperation for the realization of measures by the involved actors, during the planning process of river management measures"*, or in short terms "*Lack of cooperation"*. If one takes a glance at cooperation issues itself, in general the necessity of public works are well accepted, and supported, but soon it comes down to the projection of measures on private property the phenomenon of public interest contradicting self-interest arises. This often results into fierce opposition that makes the realization of public development complex and long lasting processes. In order to gain the needed cooperation for implementing measures, traditional incentives like land readjustment and compensation are the most deployed incentives. Experience wise these incentives do not necessarily guarantee willingness to cooperate (appendix A). It is striking that social incentives like civil involvement in order to convince or gain trust are not widely exploited in order to gain cooperation. The same holds for participation during the development processes. To a certain extent this can be seen as a gap within the planning process of public work development that impacts its effectiveness. Reasoning from those insights in this project the assumption is made that incorporating plurality into planning enables the process to hook on to different perceptions and perspectives of involved actors. *Perception* as "*… an idea, a belief or an image you have as a result of how you see or understand*" (OUP, 2010, p.1126), and *Perspectives* as "*…a particular attitude towards …*" or "*…a way of thinking about…*" (OUP, 2010, p.1132). The aim of the whole project is to establish a concept that is able to contribute to the increase of cooperation with the implementation of Public Works development, and thus to the increase of the effectiveness of the planning process. The baseline behind this project is built on three key assumptions. Summarized these three assumptions are: 1) *A dominant factor in the time overrunning problem of River Management Development is caused by opposition* (the research problem of *lack of cooperation*), 2) *A consensual approach will be an improvement for the effectiveness of the planning process of these projects* (a direct link to the research aim of *improving on effectiveness*); and 3) *Communication* (appropriate *incentives*) *can increase the chance this needed consensus*. Content-wise, this project follows a deductive path that basically can be divided into three main phases. Successively, a first phase sets the theoretical framework of the study, a second phase that develops the method for testing this theory, and a third final phase that analyses of the results of the test. During this project the stance is taken that difficulties regarding lack of cooperation are a product of different *perspectives* on e.g. the effect of these measures, and different contextual attitudes towards the necessity of the measure (*perceptions*). Bundled, this can be seen as an expression of plurality. For this research the theoretical framework of *Cultural theory* is seen as a platform that is capable to analyze this plurality. Because the framework acknowledges the fact actors are not homogeneous groups, but rather as individuals who can be characterized by *(risk) perceptions* and *perspectives* who can be classified into *rationality classes*. And even more importantly, the framework gives insight in why these different *perceptions and perspectives* are dismissive towards specific measures, and thus interfere the *effectiveness* of the planning process. It is this framework that was taken as the foundation for establishing a concept that is able to contribute to the increase of cooperation. The for this project established conceptual model – the *"Prism"*-concept – is in fact develop in order to solve stagnation within the implementation process of river management measures. Ideally the implementation process would flow along a straight path trough the Planning-phase via a Preparation-phase into the Implementation-phase. The Preparation-phase includes among others the aspect of land acquisition for the actual realization of the measures. Traditionally acquisition strategies based on land readjustment or compensation are deployed, however due to the effect of perceptions and perspectives these two incentives are not always sufficient. And thus result into unwillingness (lack) to cooperate with the acquisition procedure. This eventually results in stagnation in the planning process. So to say the flow of the process does not fit all the perceptions and perspectives of the actors perceptions. The idea behind the conceptual model is to eliminate the stagnation and restore the flow of the process. The concept tries to achieve that aim by merging three sub-phases into the planning process. In accordance with the deductive strategy that this project follows (figure) the just mentioned theoretical conceptual model needed to be proved by demonstration. For this purpose an experiment that tests the theoretical approach in reality has been established. In essence the test comes down to the application of the concept in a real life situation of a river management developing area. Basically the experiment underpins the theoretical claims of the model. The actual experimentilization comprises tests for demonstrating the working of the mechanisms of Cultural Theory within a planning area, and a test in order to prove the idea of the effectiveness of incentives that fit rationalities. These first two tests should confirm the influence of Cultural theory in the actual planning process by: 1) *Demonstrating that actors can be classify into archetypes*, and 2) *Archetypes share a certain worldview and cultural bias based on their perceptions and perspectives*. A third test is expected to demonstrate that applying incentives that fit these worldviews and cultural biases will increase the preparedness to cooperate with the implementation of river management measures. After setting and performing the experiment the final phase of the project focuses on the analysis of results out of the experiment, with the aim to evaluate to what extent is the concept capable to improve the effectiveness of the

planning process of river management development. The focus of this phase was thus mainly about analyzing how the model performed during the experiment. In general terms the outcome of the experiment could be translated to two concluding remarks namely: 1) Based on descriptive statistics there are clues that *actors within a river management development area indeed can be categorized*, and 2) *When it comes to cooperation for river management development these categories share to a large extent the same preferences for a certain types of incentives*. In both cases the conceptual model was the device by which the categorization could be made, so to that

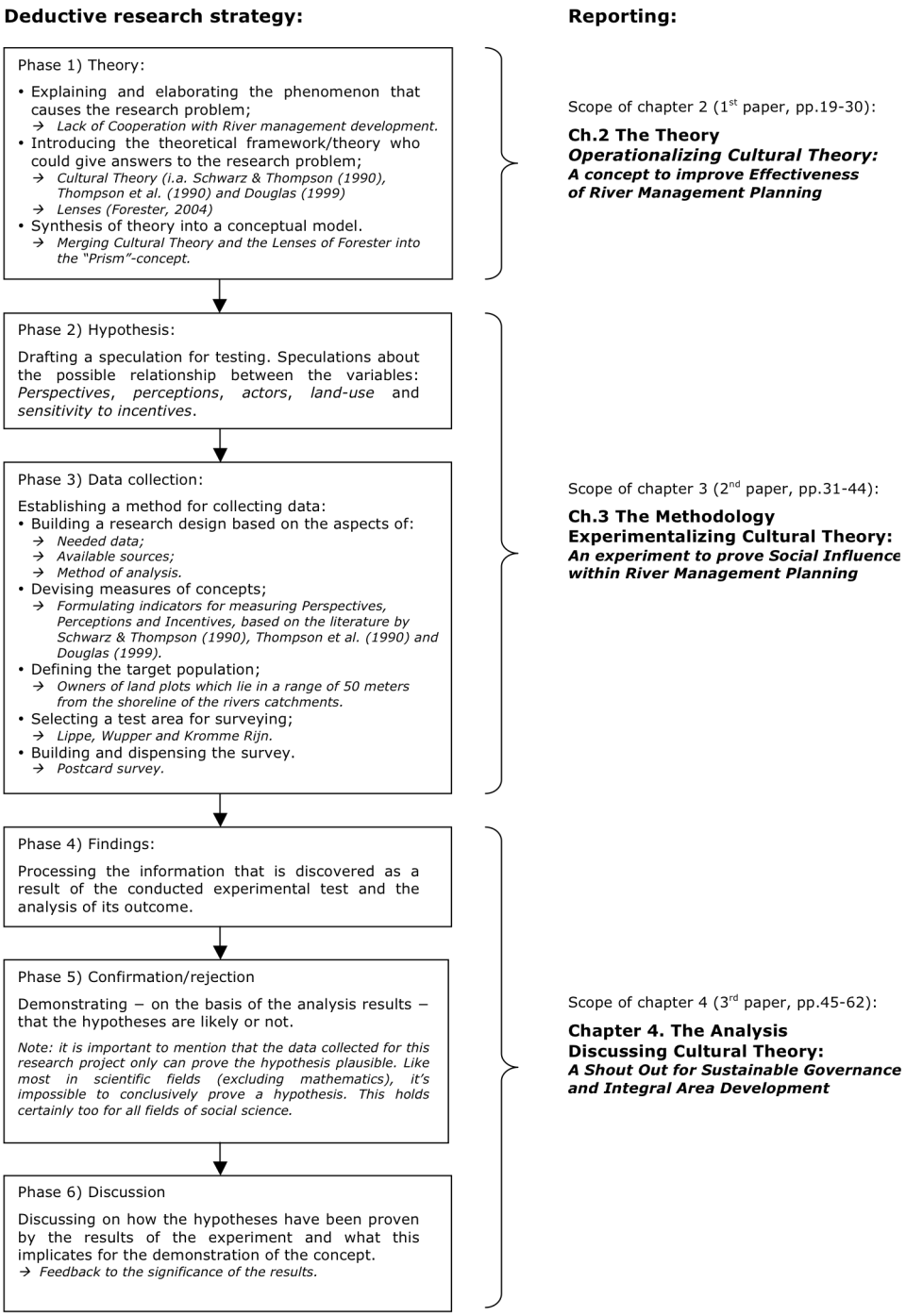

Figure S.1. Research path of the project

extent these two clues embody the concept. So in that sense, the for this project established concept – that should be able to contribute to the effectiveness of the planning process – was demonstrated in a positive way. However the results out of the experiment have not yet been distinctive enough to arrive at solid claim. Therefore, the conclusion for this project can not be other than there are good grounds to have expectations that the "Prism"-concept is able to *improve the effectiveness of the planning process of river management development* but to arrive at a full claim further research is needed.

Preface

"… Good Morning Ladies and Gentlemen, we'd like to inform you we've just entered Dutch aerospace and within an approximate twenty minutes we'll touch down at Schipol Airport…" The cold AC breeze of the China Airway 747-400 hits my face and pulls me back into reality. For a sec I'm like *"…what was that very special occasion of today…?",* cuz at the moment the only thing I feel is kinda racked. ……. My army training enables me to sleep in virtually every condition, which might seem like a blessing, but waking up ….. well, I guess waking up will never become my thing. Soon I slide up the window cover a raspy voice from behind me says *"Hey the Amsterdam Arena!... In my childhood I used to play soccer over there…"*. I turn over my head to the left where a warm smiling face of that dude whom I spent my last two hours with in one of those bars at *Don Mueng* airport. *"Nice…"* is the only thing that pops up my mind, and it comes with a grumpy face. Luckily the message lands immediately and our conversation ends.

With this scene I open my MSc-thesis bundle *Introducing the Prism-concept* (2017) because honestly that's how the day that led me to this point in life began. The bundle you are about to reed is the final of my study *Urban and Regional Development* at *Utrecht University*. It was a bumpy ride to get to this result, with a lot of pleasure but some tragedy too. To that extent this *"experience"* is another episode of my life. I guess human life has to come with ups and downs. No exceptions for me. Every now and then I consider the question *"Was it all worth effort?"* But it's a question hardly to answer, because after all I'm a human being. For the fact our human soul is a derivate from experiences, worldviews and biases, life is from my point of view a bundle of narratives. Some narratives of my life gained form this experience, but there are some regrets too. I leave wisdom regarding this subject to another field of science though. However to a certain extent it has something to do with my research project you are about to read. And if you manage to read this bundle up to the end you get a rough idea of what I mean by this.

But lets take a glance on how my actual career at the *Faculty of Geo Sciences* begun four years ago (2013). I cannot deny my first academic experience was quite sobering. Traditionally a course of *Planning Theory* is the faculty's kick-off for future planning students. It's a course that introduces theory behind mechanisms that (may) shape our spatial environment. And as the primal challenge for the field of *Urban Planning* is to deal with all the (both physical as social) aspects of a complex spatial environment, the body of literature is enormous. I remember sitting for the first time in that college hall with another three hundred fresh students when our teacher showed up. A typical academic appearance who clearly was the embodiment of planning. *"…Good afternoon ladies and gentlemen, have u all read the literature of today? Because you should have! And if not, you are already too late!"* These welcome words were accompanied by the adage *"You shall read for your life"*.

The classic publication *Dilemmas in a General Theory of Planning* (1973) by *Rittel* & *Webber* was this teacher's way of rubbing our faces with the fact that a modern (western) society is no longer makeable. For me, son of a 1970's engineer – and practicing civil engineering myself – this article was a huge shock. Form my *perception* I truly believed that serving society in a proper way was about providing for a coherent spatial area in where all the necessary public purposes have been merged. An exercise in order to move forwards in development; economical growth if you like. And even more important I had a *perspective* that such an exercise could only be based on well-proved solid knowledge and technical insights. To complete this picture; at the time I applied at *Utrecht University* my initial aim was to become a highly trained specialist, educated for *"designing"* development environments. Something that in my opinion could only be done based on knowledge. As in applicable knowledge on how to do that in the *"right way"*. University would be the institution that provide for such knowledge right?... Not exactly I figured out that that lecture,... at least not in that way. With the *Rittel* & *Webber* article our teacher introduced the concept of *"Wicked Problems"* instead! A concept that comes with the message *"..there is no right nor a wrong way…"* to the extent of spatial development (Rittle & Webber, 1973, p.162). With the best intentions,… this kind of vagueness – a word I nowadays regret writing down – was far beyond my ability to comprehend. Couldn't do anything with this kind of matter what so ever. Other than, smile and wave to the teacher, bump the lecture into my head, pass the exams, and leave it for what it is. Summarized in bold words, I was deeply stuck in a technocratic paradigm and if this was what university had to offer there was no yield in it for me, other than obtaining a degree. *"Fair enough"*.

Like the teacher promised, during my whole period at *Utrecht University* I had to read for my life to keep up with the program. That pressure made me read large amounts of books and publications about all kinds of concepts, insights, governance modes and explanations, on all kinds of phenomena that shapes the spatial (build-) environment. Which actually turned out to be a good thing, because along the way I slowly lost my dismissive attitude and during my daily practices as a water manager I even started to recognize the theoretical patterns described by literature. Soon I figured out the value of this kind of matter my appreciation started to grow exponentially. I even became hungry for theory so to say. At a certain point I started to acknowledge the need for grand theories (e.g. Systems theory by Lumann) and seriously considered to read Habermas, as I believed that this specific theory[1] would apply to my thesis. Unfortunately my copies of *Theorie des kommunikativen Handelns* (1981) are still untouched pieces in my personal stock of literature. Not so much because I lacked the interest but ironically my teacher Planning Theory strongly urged me *"Stop reading Vincent!... Start writing!"*.

It seems to me that here at the *Planning Department* of this university synthesizing existing theory is seen as the most important method for our field of science. As virtually every course comprises essay assignments and producing papers. And thus students get mainly trained in this skill. Basically the methodology comes down to discussing existing theory and then compose it into new ideas or explanations. It is an effective method and (social-) scientifically seen, a power full skill. Isaac Newton once described this method by the metaphor *"…standing on the shoulders of giants"* (Newton, 1676). It was during a drafting session of one of those paper assignments I noticed the great influence of *Cultural Theory* on the spatial environment. Or actually how the phenomenon, which is contained in this framework, impacts a spatial planning process. Claiming this insight all for myself would do unjust to a very intelligent young lady. Someone I deeply respect and who actually caused my *"Eureka!"*-moment that led to this research project. I don't know what the exact chemistry between the two of us was about but we worked

together throughout the entire MSc-program. Nevertheless, our way of drafting was characterized by long and passionate debates about how reality came about. I think this had allot to do with the fact that she had her origins from the field of *Art History* at *Leiden University* and thus capable of reasoning from a more social orientated paradigm. A mindset concerned with society and the relationships among individuals, so to say. Contradictory to that, I'm educated in *Civil Engineering* at *Van Hall Larenstein University of Applied Sciences*. So my approaches stemmed from a more technocratic paradigm, driven by a problem-solving mindset that seeks answers in expert knowledge about proved concepts. It was during the drafting session of our paper *The Dutch heritage preservation process in transition: The shift from a technocratic process to a market orientated approach* (2014), when it came to me. We where engaged in fierce debate when all of a sudden, the both of us realized that regarding the aim of the subject we where at the same level. The only thing that we differed on was the insights on how to reach that aim. And the funny thing was there is indeed *"…no right or wrong way…"* just different *rationalities* stemming from worldviews and biases; different *perceptions* and *perspectives* so to say. *"Thanks Evelien, I've been standing on your shoulders."* As I did so many times by the way.

However,… back to the day it all begun… Soon landed at Amsterdam my parents and the love of my life where there to pick me up. Within an hour I was sitting a bit jet lagged but very excited at the lobby of the *University of Amsterdam* its *Faculty of Biology*. Listening in full proudness to the words spoken at the graduation ceremony of my brother. That day he obtained his degree in *Medical Biology* based on an outstanding research internship at *Cambridge University*. The words of the faculty dean were full of praise and that man predicted a great scientific future for my brother. How right these predictions where at the time is another exiting story about someone who became one of those *"giants*[2]*"* in science. Yet my story begun in fact ten minutes after the ceremony. Having a chitchat with my brothers father in law, we sat under the canopy of a Linden somewhere at the *Amsterdam Science Park*. And while staring around at all those proud faces a sunbeam brakes through and touches my face. It was August 2000 and all of a sudden it kicked in.... *"Don't wanna be the black sheep for ever, someday I'll obtain an academic degree too...."*

This bundle is about the story I've got to tell on planning theory, and comprises my contribution to science.

Vincent Emiel van Rheenen,

Utrecht, May 17th 2017.

Notes

1 Basic theoretical idea of Jürgen Habermas: People who understand each other are able to reach for agreement. If someone says something not only a statement about natural or social reality is made, it also calls on a fellow human being. Language not only describes, but it also claims validity, and convinces. Thus the use of language must be seen as a form of action (Finlayson, 2005);

2 Prof. Dr. J.E. van Rheenen: Citation Index of 4135 (3017 citations since 2012; H-index: 24; I10 index: 39). In 2009, awarded a VIDI grant and a research grant from the *Dutch Cancer Society*. In 2012, awarded a research grant from the *Association for International Cancer Research* (who have now rebranded to *Worldwide Cancer Research*), and in 2013 a research grant from *Netherlands Organization for Scientific Research* (NWO). In 2013, he received the *Stem Cells Young Investigator Award*. Received a *European Research Council* (ERC) grant for his proposal *Cancer Recurrence: Tumor cell death supports recurrence of cancer* (2015).

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Ch.1 Considering the research project: *An Introduction of the Context, Object and Process of the Problem and a Deliberation on the Study*

Time- and budget overruns are a well-known phenomena in the world of public work development; it's rather regularity than an exception (e.g. Arditi et al., 1985; Kumaraswamy & Chan, 1998; Flyvbjerg et al., 2002, 2005; Marrewijk et al., 2008; Shrestha et al., 2013). As water management belongs to the field of public work development, projects in this sector are no exception. The implementation of *river management development* is an exemplary example for the completeness of that statement. To illustrate, the International Commission for the Protection of the Rhine (ICPR), already identified in 1998 the need of thirteen retention areas, which had to be realized before 2020. At the initiation of this research project (2016) just three of them are implemented. Considering the aforementioned, the question that can be raised is: *"why it is so troublesome to arrive at this ICPR demand"*? The answer to that question often can be found in the absence of cooperation of the landowners and stakeholders (actors) with the initiating institutions. Although *river management development* can often be fully legitimized by catastrophic events – like *"Room for the River"*-measures can be legitimized by the major flooding events throughout Europe (e.g. 1995 the Netherlands; 2013 several parts of Germany; 2016 Gloucestershire, South-West England) – when it comes to realization, the public is not always eager to *cooperate* with the initiated measures. To conclude, this situation led to the formulation of the research problem of this project, which then is: "*The lack of cooperation for the realization measures by the involved actors, during the planning process of river management"*, or shortly "*Lack of Cooperation"*.

1.1 Time overrunning issues

So to the extent of time overrunning issues in the planning process of public work development, one clear problem for the cause of time overrunning can be found in a defensive posture of actors. Generally the necessity of measures is well accepted and supported, but soon it comes to the projection of concrete measures within a specific spatial area suddenly the phenomenon of public interest contradicting self-interest starts to interfere the planning process. The phenomenon, also known as the '*Not in my backyard*'-mechanism (NYMBY), utterly results into fierce opposition amongst the actors of such a spatial area. This opposition can make the realization of public development complex and long lasting processes. Such a defensive posture can even become an obstacle to meet institutional assignments initiated by amongst others the European Union (EU) or the just mentioned ICPR.

Instruments

In order to gain the needed cooperation for implementing measures land readjustment and compensation are the most deployed instruments. However experience wise these kinds of instruments do not necessarily guarantee willingness to cooperate (appendix A, pp.73-74). Obviously one may expect the effectiveness of the instrument to increase as soon as it becomes lucrative for the landowner to cooperate. Yet within the scope of this research project, the stance is taken that profit may never be the mechanism to gain cooperation. So given the difficulties to stage cooperation from the actors one may consider whether the tools to arrive at this cooperation are the most effective or not? One of the gaps within the process of public development might be the fact that social aspects, as in civil involvement in order to convince or gain trust, is not yet fully exploited. A major element of this research will be to investigate, to what extent incorporating participation can be a fruitful addition to the current planning process of river management measures. The assumption is made that incorporating participation into planning enables the process to hook on to the different perceptions and perspectives of involved actors. Perceptions as in how an individual *sees or understand* legitimacy for measures, perspectives as a personal *attitude towards* the implementation measures.

1.1.1 Scope of this research project

Before launching this research project a necessary first exercise is a demarcation of the scope. After all the purpose of the whole project is to provide insights into a specific problem within the field of urban and regional planning. As the initiative for this project stems from difficulties in planning progresses with regard to the implementation of river management measures the scope, of both theoretical considerations and the experiment will remain *river management development* initiated from water tasks imposed by EU-directives. As previously mentioned, apart from the research problem of *"Lack of Cooperation"*, one important starting point of the project is the assumption that such lack is partly due to the limited number of instruments for gaining cooperation. Limited in a sense, that the current process only provides instruments to solve material aspects, and let the social aspects into consideration. The research primarily focuses on finding ways of communicating with respect to different perceptions and perspectives of the actors whose cooperation is necessary. The purpose of this research is to prove: 1) *The influence of perceptions and perspectives on the land acquisition process*, and 2) *That reflecting on those perceptions and perspectives during the implementation of measures could gain on the readiness of cooperation*. With the help of this knowledge the planning process on river management development could be improved to the extent of its *Effectiveness*. In order to achieve this result the following research question is formulated: "*To what extent does incorporating Cultural Theory improve the Effectiveness of the planning process of River Management Development?*" This question must be seen as the thread that links the aim of the project to the content of the research exercises. For the actual research a set of analytical questions have been formulated (paragraph 1.4.2).

1.2 Spatial planning for river management

The background of this research project stems from the scientific field of Urban and Regional Planning. This field of science considers planning in both theory and practice. This project is done within the practical sector of the field better known as: Spatial Planning (Spit & Zoete, 2006, p.14). Spatial planning discusses issues that deal with spatial consequences. In that sense, this area of the field focuses on a wide range of spatial problems and dilemmas; or better-said issues related to the spatial environment. In the book: *Cities on Rail* (1998) Betolini and Spit outline a framework for analyzing spatial issues. This framework is known as the planning triangle (figure 1.1), and it provides a general frame of reference. The triangle subdivide spatial issues into three interacting variables namely: 1) *Object variables* like location characteristics, 2) *Process variables*, like actors, interests and intervening factors, and 3) *Context variables*, like (national) planning systems, and internationalization processes (Betolini & Spit, 1998; Spit & Zoete, 2006). Regarding this project the three interacting variables can be named the following: the object variables of the project is the catchment of the river *Kromme Rijn*, the process variable is in fact the research problem of lack of cooperation with river management development, and the context variables of this project are the water tasks rising from European directives. All these aspects will be discussed the in the following chapters/paragraphs.

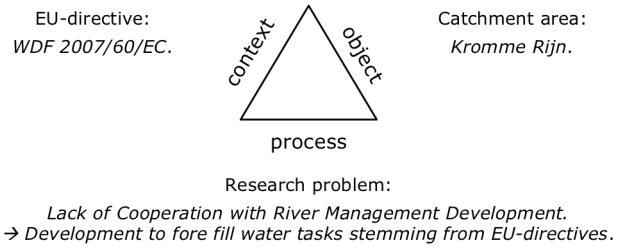


Figure 1.1. Analytical framework of the project

1.2.1 European directives

European directives are legal acts of the EU whose legal basis for the adoption of guidelines, they stem from article 288 of the *Treaty on the Functioning of the European Union* (2007). These directives require member states to achieve a particular result without the means to dictate the outcome. Directives differ from regulations because they are self-executive and therefore they do not require implementing measures. In that sense, directives provide member states a certain amount of leeway in establishing the exact rules. With regard to legitimacy, directives are only binding for member states to which they are addressed too. Once the guidelines are adopted, member states have to provide a timetable for the implementation of the intended result. In short, the choice of forms and methods is for the national authorities themselves, but directives come with planning tasks. With regard to the scope of this research project, the *Water Framework Directive* 2000/60/EC will be the contextual background of the researched object, which is *river management development* in the *Kromme Rijn* catchment area.

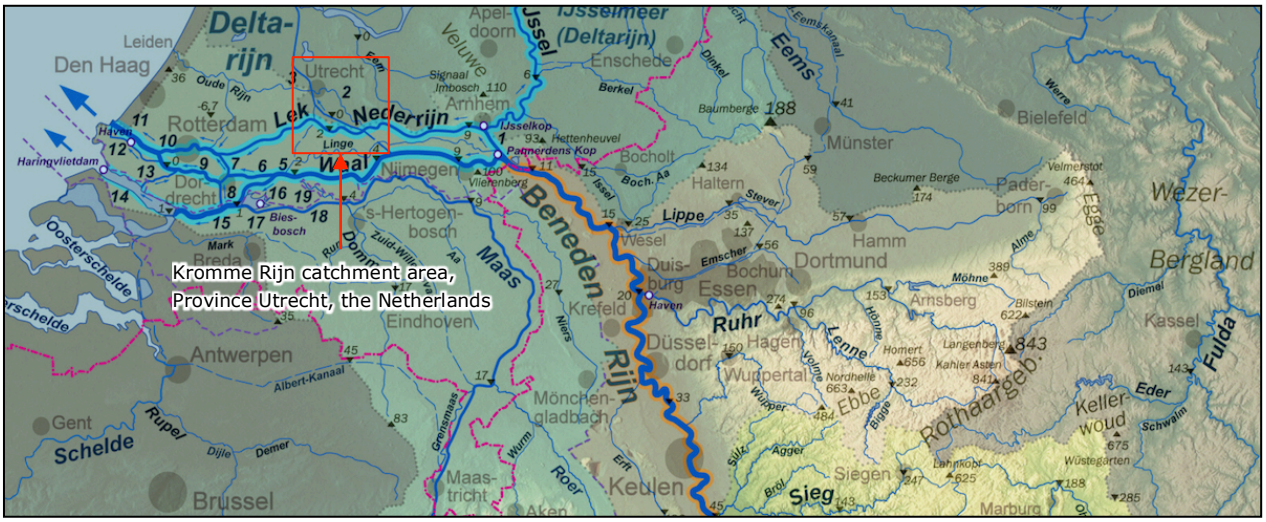


Figure 1.2. Testing areas

Water Framework Directive

The *Water Framework Directive* (WFD) is a European directive to which each EU member state its institutional water management must meet. Since 2015 the directive requires water quality of European water systems to meet certain standards. The aim of the WFD is a sustainable protection of ecosystems and water resources. The directive has been established since the end of 2000 for the water management of both European groundwater and surface water. The scope of the directive basically concerns river catchments, but is sometimes further merged into river basin districts; the capillaries of a river basin so to say. Initially the WFD required all EU member states to draw up joint action plans for each of their river catchments; action plans, that should cover all aspects of water on the *WFD*-agenda. Already since 2009 all member states have prepared their action programs with regard to WFD water tasks. In the Netherlands the (water)management plans relating to the WFD water tasks [translated to Dutch: Kader Richtlijn Water opgaven] will be planned and developed by the provinces and water boards. The experiment of this project has taken place in a management area that falls under the jurisdiction of the province of Utrecht.

1.2.2 Water quality

In recent years large parts of the river Kromme Rijn have been redesigned to function as stepping-stones in the provincial ecological corridor. To achieve location factors of the desired ecological systems, natural riverbanks needed to be developed and several lots of (former) agricultural production land have been appointed to WFD-aims. These newly appointed parcels have been recently developed into natural areas. As a result of these measures, the water quality of the Kromme Rijn has been substantially improved, and houses nowadays several rare dragonflies, amphibians and fish species. Because of the recently implemented river management measures the Kromme Rijn catchment is an ideal testing area for this research project. This has all to do with the fact that actors along this river will have, due to this development, strong associations with the development of such measures (STOWA, 2005, 2011; RWS, n.d.).

Kromme Rijn catchment

The river Kromme Rijn is probably originated around the year 1000 BC, and was once the main branch of the river Rhine towards the North Sea. However since the beginning of the era the river Lek began to play an increasingly important role in discharging to the North Sea. In the year 1122 the bishop of Utrecht commissioned the damming of the river Kromme Rijn, near Wijk bij Duurstede. This marked the end of the river in its function of discharging of Rhine water. In it's nowadays shape the river is running from the Lower Rhine at Wijk bij Duurstede to the canals of Utrecht. Its complete catchment area is inside the province of Utrecht. The river measures 28 kilometer and meanders in a northwesterly direction through the urbanized areas of Cothen, Werkhoven, Bunnik and Odijk to the city ofUtrecht. The connection between the *Lower Rhine* and the Kromme Rijn is made by a water inlet and a lock. An important reason for letting water in is to prevent desiccation of the hinterland. During spring there is a very high water demand by fruit growing companies who are located along or near the river. These companies need water to spray their crop in order to protect the fruit from frost damage (Utrechts Landschap, 2011).

Spatial features along the Kromme Rijn

Starting at the sluice/inlet the Kromme Rijn basically flows past the town of Wijk bij Duurstede. There after its flows through an open countryside until the river meets the village of Cothen. After passing the urbanized area, the stream flows through an area of old meanders and continues its way along the provincial road N229 towards the village of Werkhoven. A mixture of farmland and natural areas who are located at former clay extraction location characterizes this part of the watercourse. North of Werkhoven the river passes a cultural heritage site (castle Beverweerd) and heads for the village of Odijk. This village is almost entirely surrounded by the river. Between Odijk and the town of Bunnik the Kromme Rijn flows through an industrial area and passes the railway *Utrecht-Arnhem*. After passing the urbanized area of Bunnik for a distance of a few kilometers long the river runs through a piece of preserved nature. Then the Kromme Rijn is making a curve to the west and crosses the cultural and historical sites of Fort Rijnauwen and the manor Oud Amelisweerd, where after the river reached the city of Utrecht (figure 1.4).

WFD-measures

In order to reach WFD-objectives, EU member states should implement amongst other things a number of measures to restore quality of their waters. In the Netherlands, water-managing institutions, both the National Traffic Department [Rijkswaterstaat] and the 23 Dutch Water boards, are assigned to implement the EU directive properly and effectively. Initially (2000) in multiple places in the Netherlands the water quality was in many ways inadequate. This situation resulted into a list of water system related issues who had to be solved by the water managing institutions in order to reach the EU-requirements; the so called *"water tasks"*. These water tasks addressed the quality issues on the basis of a division of four main themes, respectively: 1) *Clean water*, 2) *Fish migration*, 3) *Restoration of natural habitats* and 4) *Restoration freshwater saltwater transitions*. One of the objects of this research project concerns the planning and implementation of measures with regard to the third theme, namely the restoration of natural habitats.

Figure 1.3. Nature-friendly shoreline (left) vs. hard shoreline (right)

Figure 1.4. The Kromme Rijn catchment area

With regard to the catchment area of the river Kromme Rijn, the responsible water managing institution (Hoogheemraadschap De Stichtse Rijnlanden) gave substance to their WDF-water task by planning and implementing *"nature-friendly shorelines"* a the banks of this stream. A nature-friendly shoreline is basically a gradual and natural transition from land to water. At the moment many banks of the major Dutch rivers are lined with stone revetment, wooden timbering or conducted in steep slopes. So banks along Dutch rivers and canals are steep and constructed (sometimes indicated as *"hard"*-shorelines) which results into little chance for plant and animal species to develop. By introducing less steep shorelines, aquatic nature is given space to prosper and wildlife is given opportunities to move from land to water and vice versa. With the aim to restoration natural habitats, and thus improve ecological quality within rivers, water managing institutions replace these *"hard"*-shorelines (figure 1.3, right) for more *"nature friendly"* shorelines (figure 1.3, left). By doing so the banks stays protected from erosion by a zone of aquatic vegetation, and at the same time the zone creates a new habitat and a shelter for various plant and animal species (RWS, n.d.; STOWA, 2011). The planning issues that will rise with the implementation of this type of measures are mainly related to the demand for space. These issues rises because the design profile of a nature-friendly bank will be indeed projected deeper into the hinterland than the profile of a traditionally hard edge bank that feature a steep incline (figure 3). In essence this implicates that the development of WDF water bodies means obtaining land.

1.3 Planning process

The definition of a spatial planning process can be summarized as: *"The search process by which the planning actors develop coherent ideas and strategies in order to guide reciprocal alignment of space and society, with an aim to implement public purposes. All done in the context of policy formulation, implementation and support deliberate and democratically legitimate decisions on tackling spatial issues"* [translated from Dutch] (Hidding, 2006; p.91). In such a (planning)process the initiating actor – usually from a governmental origin – have mainly a legal focus on habitability, protection and environmental improvement of a country in general or a management area in case of lower (more sectorial) governmental authorities (e.g. art. 21 Grondwet [Dutch Constitution]; art. 2.1 Waterwet [Dutch Water act]). The Dutch Water act for instance requires water managers to meet a number of important watersafety (flood risk) and water quality norms.

Water managing area

However to the extent of a water managers managing area, there can be a (gradual) shift observed. A shift in approach of water management in order to tackle water related issues from a technical approach, towards a more management-based approach (e.g. Room for the River-projects). In literature this shift is referred as a paradigm shift (e.g. Roth & Warner, 2007, p.520; Moss & Monstadt, 2008; Mostert & Junier, 2009, p.4962; Hartmann & Albrecht, 2014).

This paradigm shift towards water management comes with the introduction of new challenges. Challenges who until this mentioned shift where no content of river management measures implementation process (e.g. building dykes and levees). These new challenges include amongst other things an increasing emphasis on cooperation and participatory decision-making in order to achieve results (Moss, 2012, p.4). And it has all to do with the fact that scope of the planning area shifts from the clear demarcated water management area of the land outside the dykes (jargon: *"between the dykes"*), towards the hinterlands. The spatial use of land between the dykes has always been clear and undisputed. But now with the shift towards the hinterlands, because of the differences in views regarding the spatial use of land, and the property rights that go with them, the implementation process of river management measures needs to pass through considerations and negotiations of different actors – representing different perceptions and perspectives regarding spatial requirements (plurality). This makes the implementation process of river management objectives, more based on governance, while traditionally it was based on the technocratic top-down approach of engineering. Which is arguing from one or more task-oriented, often legally supported, perceptions and perspectives (stemming from e.g. safety by *directive 2007/60/EC*; or ecological aims by *directive 2000/60/EC*). Thus due to this shift other, than purely technical reasoning, perceptions and perspectives have been introduced into the field of water management. And this comes with a need for a different – less technical – approach (Moss, 2009).

In short, like Roth and Warner already were pending in their publication: *Flood Risk, Uncertainty and changing River Protection Policy in the Netherlands: The case of 'Calamity Polders'* (2007), the *"water management"*-sector needs, because of this shift, a *"spatial turn"* (p.521). And this is an unfamiliar approach for this sector; because, as mentioned the implementation of flood prevention measures can no longer take place through a top-down approach, as there will be different interests – other interests then safety from flooding – involved in the implementation process. This implies that consensus, as a requirement will be introduced into the planning process. And therefore consensual negotiation processes needs to be incorporated into the, until recently technical implementation process based on legal legitimacy.

1.3.1 Priority consequences

Consequence of the just mentioned shift, regards a priority issue. Not only the land-use legislation of the hinterlands differs in character from water legislation, but also the fact that legislation in this area is not specifically tailored to the issues of water management. Within this planning area, the importance of e.g. flood protection is often recognized, but there is no specific water related responsibilities described in the for this area reigning legislation (Hartmann & Spit, 2012, p.104; Reinhardt, 2004, p.420). One could say that spatial legislation for the hinterlands gives no basis for prioritizing specific responsibilities related to water management. So given the fact that the task of land-use planning is to find a balance in all fields of land-use (e.g. agriculture, industry or housing) this may create tension. After all, from its legal responsibility, a water manager will make priorities considering the need of flood

prevention, while the land-use planner will consider water related issues (e.g. flood protection) without a priority assessment regarding to other functions. Thus legislation in the hinterland gives leeway to prioritize the interests of other land-use functions (e.g. housing or industry) above flood preventing measures (e.g. retention areas). To resume, the previously mentioned scope shift from a management area between dykes, based on a *'Separating water from land use'*-principle, towards a *"Room for the River"*-approach, implies that the water manager's job has got to de done within the premises of another discipline; the territory of the land-use planner. This is an area where other mechanisms shaping the spatial environment. Thus accordingly to the modification of the scope of water management, the current legislation and instrumentation provides inadequate formal competences for the water manager's new managing area. This implicates that behind a seemingly simple change in water management approach – from a technical approach of flood risk protection towards a flood risk management approach – there lays a world of differences (e.g. in organizational structures, mechanisms and legislation). These differences have a direct impact on the implementation processes of river management planning in a sense that, due to the lack of specifically tailored legislation to the issues of water management, implementation of these projects is subject to the willingness to cooperate.

1.3.2 Research problem: *Lack of Cooperation*

Although, the implementation of river management measures can be legitimized by legislation (e.g. the Flood Management directive 2007/60/EC) or by the general purpose of protection against flood events (e.g. like what happened in several parts of Europe during 2013), to the extent of property, actors are not always eager to cooperate with the initiated plans. It can be stated that the realization of new public works, generally goes hand in hand with a difficult implementation process (e.g. the deepening the Unterelbe, Hamburg; Deepening the Westershelde estuary, Antwerpen). These difficulties quite often stem from the fact that the implementation of such kind of measures is associated with the demand for space. Space, which in many cases is not owned by the (governmental) initiator of a particular measure. This ultimately leads to the planning on property of (private) actors with different interests than the governmental initiators. This is a situation, which in multiple cases has lead to fierce opposition and long lasting implementation processes (e.g. Betuwe freight-line, the Netherlands). Planning processes of river management measures like *'Room for the River'*-projects are expected to be no exception on this (e.g. assignments by the ICPR[1]). To become more concrete on the problem of this particular research project; the lack of cooperation for the realization of river management development projects result into complex and long lasting implementation processes. So to say considering the aforementioned, the primal question that has led to the initiation of this research project would be: *"How to stage cooperation for implementing these river management measures"*.

1.4 Research project

Content-wise, this thesis bundle consists three papers that together describe the deductive path this research project follows. Successively, the first paper describes the theoretical stage of the research (phase 1 of the deductive process), the second paper explains the methodological stage (phase 2 and 3), and the third and final paper elaborates on the analysis of the by experiment obtained data and also describes the ensuing discussion on the method (phase 4 to phase 6).

1.4.1 Research Strategy

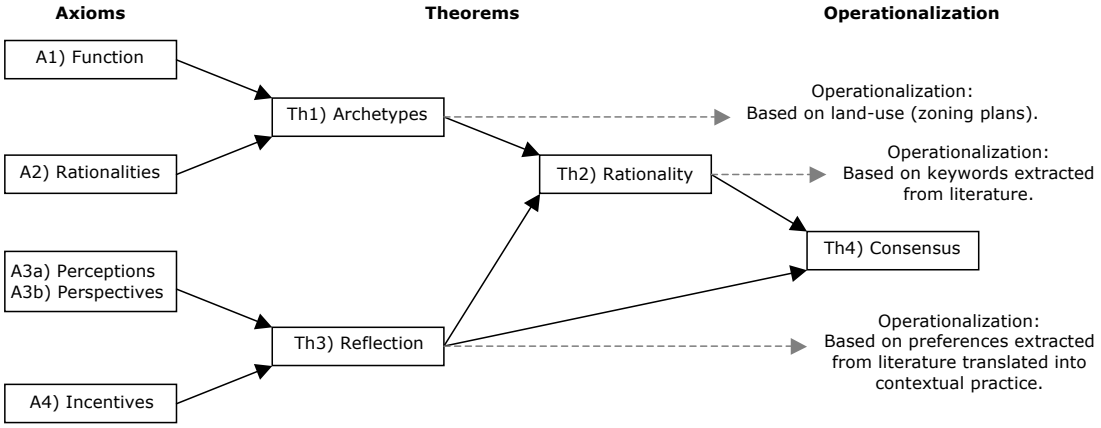
The aim of the whole project is to establish a concept that is able to contribute to the understanding, analyzing and reacting on the research problem of lack of cooperation with the implementation of public works development. With the addition that this project only focuses on river management development. As mentioned above, the setup of this project is based on a deductive approach, so theory behind the project will be structured into an experiment correspondingly the Euclides-model (figure 1.5). As the Euclides-model structures the operationalization of the experimental setup for obtaining observations, the baseline of philosophical mindset behind this project is build on three key assumptions. In a reduced form these three assumptions can be summarized as: 1) *A dominant factor in the time overrunning problem of River Management Development is caused by opposition* (the research problem of *Lack of Cooperation*); 2) *A consensual approach will be an improvement for the effectiveness of the planning process of these projects* (direct link to the research aim of *improving on effectiveness*); and 3) *Communication* (appropriate *incentives*) can increase the chance this needed consensus.

As the whole project will be done on the basis of deductive analyzing, the first stage of the research is to create a theoretical basis; this specific demand gives rise to the first paper of the project. To do so, firstly the research problem of the lack of cooperation with the implementation of river management development will be outlined and considered. Secondly theoretical considerations, with regard to the research problem, have to be made in order to explain the phenomenon. These considerations will be based on existing theory, which is Cultural Theory. The reason why Cultural Theory is seen as a framework that is capable to explain the phenomenon is found in the fact that it is based on plurality. In this project the stance is taken that difficulties with reference of lack of cooperation are a product of amongst other things different perceptions and perspectives. Cultural Theory acknowledges these differences, and even more important, it gives insight in these differences. And finally, there will be considerations made about how this existing theory can be operationalized and merged into a concept for understanding and analyzing the given problem. The later will be done in order to give rise to the mentioned difficulties within river management development on the one hand, but more importantly, to arrive at possible a theoretical concept of the problem within this field. The concept might eventually contribute to the effectiveness of the implementation process, because it is capable to address the difficulties (lack of cooperation).

The next stage of the project will be to include this theoretical framework into a test (experiment) in order to prove its claims. This exercise must be done because based on the just elaborated first stage of the research, two

statements will be made, namely: 1) *The mechanisms of Cultural Theory have a great impact on the effectiveness of River Management Development-planning*, and that 2) *An appropriate Communication(strategy) can contribute to increase this effectiveness*. Both are bold statements, which needs to be properly established on the basis of figures before it can become a valid claim. The intention of the project is to prove that by acknowledging the mechanisms of *Cultural Theory*, and then respond corresponding to this phenomenon; the chance on cooperation will increase. And thus will be an improvement on the effectiveness of the planning process. The specific *aim* of this second stage of the research is to establish an experiment that is able to test the theoretical concepts, that is expected to contribute to the understanding, the analyzing on the *research problem* (the *Prism-concept*). So, the core of this stage will be about experimetalizing the conceptual model by testing the claims of *Cultural Theory*. Accordingly to the process of deduction[2], this research project tries to prove theory by confirming hypotheses. The chapter/paper that reports on this methodological phase (chapter 3/2nd paper) gives a full explanation on how the experiment is built by explaining on: 1) *What data sources will be used*, and 2) *How to distillate data from these sources by operationalizing theory*.

The final stage of this project concerns the elaboration on: 1) *The findings of the analysis of data*, and 2) *The discussion on the results of this research*. Likewise these last two subjects are the scope of the third and final paper of this project. Note that incase of pure fundamental science a deductive approach would also contain a revision of theory. But since this project is initiated and funded on behalf[3] of the Hochwasser Kompetenz Center (HKC), the research is conducted in a context of applied science, thus theory is applied instead of derived. So to that extent the main concern will be testing the hypothesis in order to prove theory in practice. The practical idea behind the setup of the project is that, once demonstrated the influence of the mechanisms of Cultural Theory to river management development planning, this knowledge can be administrated to communication strategies during such planning processes. The mechanisms of Cultural Theory refers in this sense to features of perceptions and perspectives of the various (arche)types of actors acting within such a planning process. The tested strategies, in this project also known as incentives, are formulated in such away they will anticipate to the (theoretical) characteristics of these perceptions and perspectives. This should depict that a consensual approach – to hook on different actor rationalities – will utterly is expected to be an improvement on the effectiveness of the planning process.



Axioms:
A1) Land-use divides objects into categories [Function];
A2) Cultural Theory divides subject into categories [Rationalities];
A3) Rationality represents a (world)view on reality [a) Perception & b) Perspectives];
A4) Reality can be reflected [incentives].

Theorems:
Th1) There is a causal relation between function and rationality [operationalized by zoning plans];
Th2) Archetypes represent dominantly a certain Rationality [operationalized by Keywords];
Th3) Reflection on (world)view leads to consensus [operationalized by Incentives];
Th4) Consensus leads to Cooperation.

Figure 1.5. Euclides-model

1.4.2 Research question

Considering the overall aim to improve on effectiveness of the river management planning process one will quickly become inclined with the question: *"How to deal with the complex plural reality within a public planning environment?"* Strictly reasoned from planning theory the subject here is about consensus, because that is assumed to be cause of the diminishing effectiveness of planning processes. This means that in essence the intrinsic focus of the research is rather about *"consensus"* within the river management planning process then about the *"effectiveness"* of the process. Thus a question like *"How to stage cooperation for implementing River Management Development measures?"* would have been appropriate for the inquiry. Nevertheless, to arrive at a more applicable kind of content the subject is differentiated strictly to effectiveness. That is because the initiator of the project (HKC) started with questioning whether traditional planning strategies always turn out to be the most effective (appendix A). This implicates that the aimed result of the project is to improve on effectiveness of the process. Deepening the subject and combining the research question with the research problem resulted into the following formulation of the primal question: *"What approach gives substance to lack of cooperation, and How to react to this phenomenon?"* Yet to arrive at an answer to this very elemental formulated question one has to develop a far more analytical set of

questions. Analytical is meant here in a sense that one has to formulate a set of questions that support a logical method of thinking about the research problem by looking separately at al the parts of the path that leads toward the answer. It is already extensively mentioned that the for this project chosen path is a deductive one, so in order to support that deductive path for each stage of the research strategy there have been a research question formulated. As each of the papers in this thesis bundle covers one specific stage of the project, each of these research questions will be the starting point of elaboration. So successively, as the first paper must give content the theoretical framework of the project, its (main) research question is formulated as: *"What difficulties does the implementation process of river management development measures bring, and How can Cultural Theory contribute to the effectiveness of its planning process?"* Once the theoretical framework is put apart in the second stage of the project, the method for proving theory will be developed. The starting question underlying this exercise will be: *"What method gives substance to theory, and How to encapsulate the concepts?"* The third and final paper covers the last phase of the project. This phase is about the analysis of observed facts out of the experiment, or more specifically said, about analyzing the data that is obtained by survey in the Kromme Rijn catchment area. To support both the analysis of the obtained data and the discussion on the performance of the concept afterwards the question for this particular phase is formulated the following: *"To what extent is the concept capable to improve the effectiveness of the planning process of river management development?*" The final concluding chapter of this thesis bundle will focus mainly on the application of knowledge acquired during this project. Below a summarizing table (1.1) of the just mentioned research questions.

Table 1.1. Overview on the research questions

Research question	Elaboration	Conclusons
Primal research question: *"What approach gives substance to lack of cooperation, and How to react to this phenomenon?"*	*Chapter 1, Paragraph 1.4.2 (pp.13-14)*	*Chapter 5, Paragraph 5.4 (pp.65-66)*
Analytical sub-question on the theory: *"What difficulties does the implementation process of river management development measures bring, and How can Cultural Theory contribute to the effectiveness of its planning process?"*	*Chapter 2/Paper 1 (pp.19-30)*	*Chapter 5, Paragraph 5.1 (pp.63-64)*
Analytical sub-question on the method: *"What method gives substance to theory, and How to encapsulate the concepts?"*	*Chapter 3/Paper 2 (pp.31-44)*	*Chapter 5, Paragraph 5.2 (p.64)*
Analytical sub-question on the analysis and an opening to the discussion: *"To what extent is the concept capable to improve the effectiveness of the planning process of river management development?"*	*Chapter 4/Paper 3 (pp.45-62)*	*Chapter 5, Paragraph 5.3 (pp.64-65)*

As mentioned throughout, this study was established on the basis of applied science, or better said applied research. This type of research represents the part of science that aims to solve a problem – or in this case to develop a strategy to counter a problem – this type of research is inspired from questions that are initiated from daily practice. Both the initiative and the input for the formulation of the research problem of the project are commissioned, and maybe even more important funded, by the HKC (appendix A). So the final result should be accompanied by recommendations. To give content to this demand the answer on the primal question of this research will be framed into solid recommendations that can be applied for practical use.

1.4.3 Quantitative research strategy

The choice to practice a quantitative strategy stems from the vision that within qualitative research it is customary the scope of conclusions on theories are generalizable limited to the number of the examined cases. This is because a qualitative researched case encompasses the full scope of the analyzed theory. In quantitative studies however, the scope of theory is usually wider defined, and therefore there will be a need to generalize over a large number of cases; thus a representation of a (potentially) bigger picture. The conviction of limitation in scope to qualitative analysis stems from a belief that causal heterogeneity is the norm for large populations (Ragin, 1997, pp.19-33). This implicates that that when a population (a number of cases) grows, the potential for the main causal relationships in theories will diminish. Or better said, during a qualitative research process the addition of each new case has a good chance of significant changes to the original theoretical model. Thus theoretical concepts by qualitative research will work perfectly for the original scope of the initial research, however soon the scope is drawn more broadly a concept risks serious complications. In case of a scope change within a qualitative research project it is likely that the researcher need to initiate a completely separate and new theoretical framework to underpinning new findings (Mahoney & Goertz, 2006, p.238). With the in this project examined subject of cooperation with river management development in mind one may come to the conclusion that the scope here regards large populations of actors, rather than a limited number of cases. Thus a qualitative approach is a less attractive option, because soon one expands the number of cases here, a qualitative approach risks the introduction of causal heterogeneity increases. After all each actor within the population has to be examined as an individual case study. In short, the research practice of this project is about many individual cases (actors). An important implication here is that causal generalizations based on a few case studies, like in qualitative work, are far more vulnerable to causal error than those based on the large N-numbers of statistical analyzes. The preference for a statistical analysis in this project is thus based on the fact that this testing method is robust, and will become less affected by changes in scope or population, and thereby increases the probability that the results are representative to similar cases; generalizability is the decisive argument.

1.5 Relevance

Basically the relevance of this project can be discussed into: 1) *Social relevance*, and 2) *Scientific relevance*. As previously mentioned, this research project is not so much done in the context of fundamental science, so to that extent the project must be placed in a context of applied science. Because the concrete scientific contribution is testing a theory; testing the functioning of mechanisms of *Cultural Theory* in the *Kromme Rijn* catchment area. The social relevance is in a certain way more clearly to the surface. After all the research is conducted on behalf of the HKC and aims to support the implementing river management development.

1.5.1 The initiative

This research project is initiated by the Köln based Hochwasser Kompetenz Center [HKC] by means of *Project Steckbrief: Akzeptanz für Auenlandschaften als Retentionsräume* (appendix A). This institution concerns a member organization of flood victims, insurance companies, knowledge- and governmental institutions, all established in one Non-Governmental Organization (NGO) that brings together this variety of actors for the sake of flood protection. The core aims of the institute includes amongst other things: *Giving courtesy to flood awareness*, and *Informing on protection against flooding of public and private facilities*. To achieve these aims the institute its primal activity is to organize these various floods risk managing actors together as a network and serving as a knowledge platform for delivering expertise on flood protection. In order to arrive at these aims the platform stimulates the development and expansion of flood risk knowledge, as well as assisting in the preparation, development and implementation of flood protection projects, by initiating research and studies for sustainable, economic and, above all, practical approaches to the flood problems. Their main approach to achieve the objectives is to combine science and practice in terms of a holistic dialog on water safety and thereby promoting amongst others a focus on consensual implementation of flood protection measures. Explicitly the later focus led to the formulation of this project.

The origin of this actual project stems from the discussions on the urging need for sufficient flooding measures that started during the extreme flooding events in Central Europe (2013). One dominant aspect of this discussion has led directly to the initiation of this project. Namely the notice that prevailing (civil) interests (and environmental effects) often block the realization of so-called *"Room for the River"*-projects, because these often lead to opposition towards the planned development of flood risk measures. Such defensive posture can even become an obstacle to implement flood risk measures at all (appendix A). This actual *"Opposition"*-issue comes down to the in paragraph 1.3.2 elaborated research problem and result into the to the in chapter 1.1 elaborated *"Time overrunning"*-issues.

1.5.2 Social relevance

The aim of this research project is finding an alternative way of communicating with civil participants and landowners (actors) in order to gain cooperation for implementing river management measures. This knowledge can then be used for the development of more effective planning strategies. The project is performed because the up to now deployed traditional strategies of land readjustment and compensation did not in all cases provided the necessary cooperation for the implementation of river management measures. Cooperation for measures who are required for various legal assignments like EU water tasks e.g. WFD (directive 2000/60/EC) or FMD (directive 2007/60/EC). An alternative approach on communicating might open gates to this needed cooperation. One of the possible gaps within the planning process of river management measures is that it lacks civil involvement. Since the introduction of European directives there is a growing body of literature on participation within the scope of water management (e.g. Mostert, 2003; Enserink & Monnikhof, 2003; Bouwen & Tallieu, 2004; Tippett et al., 2005; Newig & Fritsch, 2009). So considering the different types of participation – conceptualized by the *Ladder of Citizen Participation* (1969) by Arnstein – and this mentioned body of literature, an exploration of civil involvement it is not completely unjustified. A prominent element in this research will be the investigation, to what extent civil involvement can be a fruitful addition to the current planning process. The assumption then will be that civil involvement enables the process to hook on to different rationalities (perceptions and perspectives). So to say the current planning strategies are not sufficiently able to respond to the different beliefs with regard to the measures (perceptions) and towards the different attitudes with regard to the execution of the planning process (perspectives). So in that sense, the social relevance of this research project would then be the improvement of effectiveness of planning strategies for the sake of Public Work development. The latter with the addition that the focus of this project is clearly in the sphere of water management and not on the development of public works. However, in general terms, the research problem reveals itself in exactly the same way during rail- and road construction projects, thus the social relevance of this research reaches beyond the scope of water management.

1.5.3 Scientific relevance

Also scientifically this research project has certainly some relevancy. As numerous authors have researched subjects like wicked problems, plurality, Cultural Theory. There is a whole body of literature in the form of reports, articles and other publications of both scientific, policy and consultancy origin (e.g. Rittel & Webber, 1973; Douglas, 1999; Sager, 2009; Buunk, 2010). For the matter of theory and syntheses of these kind of phenomena there is no defect. Nevertheless, to the extent of the actual demonstration of this theory, there are far less publications to be found. This suggests that the social phenomenon that causes the research problem of this project so far has been studied mainly inductive. Which in principle is not so surprising because the here discussed issues concern clearly observable facts. For example, in the case of the subject of this study: because of the prevailing democratic societal system, which enables the actors to participate in spatial planning, plurality and wickedness tend to influence the effectiveness of the planning processes for river management measures. This can be clearly observed by the fact that authorities have somewhat difficulties to meet assignments (e.g. deepening the Westerschelde, Tiesman et al., 2009). Such observations can be contained into theory, which explains the underlying complications and utterly give answers to the problem. However, at the end of the day it is also important to actually demonstrate theory, because

how plausible and well accepted theory may be, without sound evidence it still remains in the atmosphere of a description of the phenomena; a *"subjective"* construction of social reality (e.g.[4] Firestone, 1987; Howe, 1988). Partly for the purpose of preventing such a discussion, the contribution of this project is to demonstrate the influence of the Culture Theoretical concepts in the daily social reality of river management planning. This means that the over all scientific research aim of this project is thus the further validation of Cultural Theory.

1.6 Reading guide

Given the overall objective to improve the effectiveness of the river management planning process the primal question underlying this research project is formulated as: *"How to organize cooperation for the implementation of river management measures?"* To arrive at an answer to this very elemental formulated question an analytical approach is applied. The analytical approach of this research project is achieved by considering all the parts of the deductive path that should lead to the answer of the research separately. The format of this thesis bundle is set up in such a way that it describes this path. In this just closed first chapter of the thesis should be seen as an introduction to the research project, done by a consideration of the context, the object and the process of river management development. After this introduction to the project, further elaboration on the research it self be done by means of three chapters who each will be written in paper form. Respectively, the theoretical framework (chapter 2), the method and data collection, in is project mainly referred as the experiment (chapter 3) and the analysis, conclusion and discussion (chapter 4) will be reported n each of these three. Where after the overall consideration of the course of the research it is done in the concluding chapter five.

Notes

1 Assignments by the ICCP: In 1998 the ICPR identified 13 retention areas to be implemented before 2020. Until to date only 3 of them are realized (appendix A);

2 The process of deduction: With respect to this research project, the first five phases of deduction should lead to confirmation of the claims (or rejection). To summarize, the first five phases of the project comprise the following path: phase 1) Setting the theoretical framework, phase 2) Formulating hypotheses, phase 3) Collecting data by an experiment, phase 4) Analyzing the results of the experiment, and finally phase 5) the Confirmation (or rejection) of the set hypotheses (Bryman, 2012, p.24). As previously mentioned in this introduction chapter, the theoretical basis for the whole research is set in 1st paper published in this bundle (chapter 2). The 2nd paper is written in order to elaborate on the method that should prove these theoretical claims. As the experiment, which should prove these claims, is based on hypotheses, this chapter 3/2nd paper will amongst other things set these hypotheses;

3 On behave of the HKC: This research project was assigned by the Hochwasser Kompetenz Centrum e.V., who is based at Ostmerheimer Str. 555, 51109 Köln, Deutshland. The initial assignment was done by the Projectsteckbrief, Akzeptantz für Auenlandschaften als Retentionsräume, Metthoden zum geselschafttliche Diskurs & zur Partizipation, issued on January 2015 (appendix A);

4 Construction of social reality: Both publications are reflective to the quantitative/qualitative paradigm subdivision, however content wise these two articles give a clear description about the differences.

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Ch.2 The Theory
Operationalizing Cultural Theory:
A concept to improve Effectiveness of River Management Planning

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Abstract Though in the best interest for the general purpose, the realization of public works goes hand in hand with difficult implementation processes. These difficulties often stem from the fact that the implementation of measures is associated with a demand for space that is not owned by the initiators. A situation that leads to opposition by the land users and will result into difficult implementation processes. *'Space for the River'*-projects are no exception on this (e.g. assignments by the ICPR[1]). Although legalized by the Flood Management Directive (2007/60/EC) and legitimized by flood events in several parts of Europe (2013), actors are not eager to cooperate with the initiated measures. Lack of cooperation result into long lasting implementation processes. In this research project it is stated that difficulties are caused by the fact that not always the right path of communication towards the actors is followed. To that extent the actors are not seen as a homogeneous group, but rather as individuals who have certain Rationalities (plurality). The assumption is made that a deliberated communication approach could gain on the effectiveness of the implementation process. The analytical framework of Cultural Theory, by Schwarz & Thompson (1990), is seen as an explanation for the phenomenon and as a platform for testing the assumption made. In order to give rise to the river management planning process a conceptual model based on Cultural Theory is developed; this model is called the "Prism-concept". This paper elaborates on that conceptual model and on its background.

Keywords
Cultural Theory, Communication, Cooperation, Perspectives, Perceptions, Plurality, Rationality, River Management.

2.1 Introduction

The overall *aim* of this paper is to establish a concept that is able to contribute to the understanding, analyzing and reacting on the *research problem* of the lack of cooperation with the implementation of *public works* development, with a focus on the *river management* projects in the catchment area of the *Kromme Rijn* (Utrecht, the Netherlands). This specific conceptual-model is called the "Prism"-concept for reasons explained in chapter *Conceptualization*. As the theoretical framework of this research framework is build up accordingly to Euclides-model. The three for this research project important *assumptions* (axioms) are:

1) That a dominant factor in the time overrunning problem is caused by *opposition* by the involved actors, because of the lack of cooperation that inseparably comes with such opposition;
2) That a consensual approach – to hook on to different actor *rationalities* – will utterly be an improvement for the planning process of public works in general and specifically on the planning process of *river management* projects; and
3) That *communication* – in the form of appropriate *incentives* – can increase the chance on consensus with regard to the implementation of *river management* measures, and thus increases the effectiveness of the planning process.

These three assumptions represent the core aspects of the structure of the *"Prism"*-concept. In essence the conceptual model is build based on the aspects *Rationality*, *Communication* and *Cooperation*, in were these three aspects serve as phases. The conceptual-model serves the whole research project in a way that, the *Cooperation*-phase is more related to the research problem, the *Rationality*-phase is related to the theoretical framework of Cultural Theory, which will be elaborated later in this paper (see chapter *Cultural theory*), and the Communication-phase is what this research project is aiming to demonstrate. Namely, that a planning strategy that hooks on the actors rationalities, will decrease the chance of opposition, and thus increase the chance of cooperation. To that extent the theory of this research project could not only contribute to the knowledge regarding *Collaborative*-planning theory (e.g. Healey, 1997) or *Participatory*-planning theory (e.g. Innes & Booher, 2000, p.176 [Strategic planning]; Ameyaw, 2000, p.105 [Appreciative planning]; Baum, 2000 [Cultural pluralism]; Sandercock, 2001, p.13 [*"…, the point of participation,…."*]) – a contribution to scientific relevance –, but also to the *effectiveness* of the implementation processes of public work projects (societal relevance).
The research will be done on the basis of a deductive analysis so the first stage to be taken is to create theory on the basis of available literature, as well as existing findings. This specific paper is written to give substance to this first stage of the research project. It does so by,

firstly outlining the research problem, which is, as mentioned in the former paragraph, the lack of cooperation with the implementation of *river management* projects, secondly considering existing theory, and thirdly considering how this existing theory can be redeveloped into a concept for understanding and analyzing the given problem. In order to give rise to the mentioned difficulties with *public work development* on the one hand, and to arrive at possible progression on the other hand, a theoretical foundation is needed. In that sense, this paper seeks to answer the (research)question:

> *"What difficulties does the implementation process of river management development measures bring, and How can Cultural Theory contribute to the effectiveness of its planning process?"*

In order to arrive at theory that is able to come up with a plausible explanation on the first part of that question, firstly there will be an assessment regarding the *river management planning* process itself, to the extent of *implementation difficulties*. Where after there will be reasoning on how the framework of *Cultural Theory* is able to addresses these conflicts during the implementation of *river management planning* projects, and finally an explanation on how the developed *"Prism"*-concept can discuss the theoretical cause of these implementation problems. The latter exercise will be obviously done in order give an answer to the question on *"How can theory improve on the effectiveness of river management planning processes*?" The elaboration on the *river management planning* process with regard to the *implementation difficulties*, as well as the variation on the existing framework of Cultural Theory into the a applicable concept, should contribute to the scientific relevance of the research project. The following conceptual model – the *"Prism"*-concept –, and the elaboration on how this concept is able to addresses these conflicts during the implementation process of *river management projects* must obviously give rise to the societal relevance of this research project.

The following sub questions are formulated in order to arrive at a plausible explanation on the just mentioned research question:

1) What makes the river management planning process less effective (see paragraph Implementation difficulties);
2) What causes this lack of effectiveness in the river management planning process (see chapter Considerations);
3) To what extent do the mechanisms of Cultural Theory explain lack of cooperation with the current river management planning process (see paragraph Cultural Theory); and
4) How can Cultural Theory contribute to the effectiveness of a future river management planning process?

2.1.1 Justification

For investigating *the potential effectiveness of strategies* the starting point of this research project is that the conceptual model is capable of supplying this effectiveness. So to that extent the core of the research project is about: 1) *Testing the claims of Cultural Theory*, and 2) *Testing the assumption that "Communication – in the form of appropriate incentives – can increase the chance on consensus with regard to the planning of river management measures", and thus increases the effectiveness of the planning process*. The first in order to confirm the *Rationalities-phase* of the conceptual model, the second to prove that the multi-strategy procedure of the *Communication-phase* is indeed capable to gain *cooperation* (Cooperation-phase) for the implementation of river management measures, and is thus more effective.

2.1.2 Commentary

For the context it is important to realize the fact that this research project is based on one specific field within *Public Work development*, namely *Water Management*. The research subject of that field of development will be *good surface water quality status* to the extent of *river management* development, or more precise, the implementation of nature friendly shorelines areas. To that extent the scope of research project is far narrower than just *public work development*. Though these kinds of projects are in fact *public works* that serve a public purpose, *perceptions* on "water quality" will make the context of this field slightly more specific (e.g. Roos, 2014, pp.1-11; Douglas, 1999, p.413).

2.2 Implementation difficulties

The following two chapters of this paper will cover an assessment regarding the *river management planning* process itself. In order to find an answer to the first sub-question – *"What makes the river management planning process less effective?"* – there will be an assessment done on: 1) *The extent of the project implementation*, 2) *The implementation difficulties*, and 3) *Considerations* on the *present* and *possible future approach* of the actual *river management* planning process. This chapter is on the first two aspects of this assessment, namely on the *project implementation*, in order to become able to place the (planning) problem in the wider project implementation process. Where after and the implementation difficulties, in order to get insights to the actual research problem, will be elaborated. The considerations on the river management planning process will be the subject of the following chapter.

2.2.1 Project implementation

The following paragraph makes a small side step by mentioning the overall project management cycle of the implementation of water management projects in general. This exercise is done in order to become able to place the (planning) problem in the wider project implementation process of *river management* development. As the empirical part of this research project will become an assessment of the in this paper elaborated theoretical framework, executed within the catchment areas of the river *Kromme Rijn* – a side branch of the river *Rhine* –, the elaboration will be done on the basis of the in Germany used *Integrated Management System*[2] (IMS). This is the project management circle that is widely in use with water managing institutions.

In its most basic form the IMS project-cycle goes through a Preparation-phase, Planning-phase to the Implementation-phase where after there will be a so called Monitoring-phase (ISO, 2008). The Preparation-phase is basically about the first project commencement (initiation) in order to define a framework for action and to develop project-objectives (target and results). The

Planning-phase of the IMS-approach has to deal with the identification of activities with regard to environmental aspects, impacts, safety hazards and risks. This phase involves identifying and defining the various environmental aspects and related potential impacts that may result from the project, along with the safety of the hazards and risks that may arise from the activities and the (*river management*) measures. The output of this process will register the environmental, the social aspects, the impacts, the hazards and risks of the project. At this stage the objectives and targets are defined specific, measurable, achievable, relevant and timely (SMART). In this Planning-phase there will be also a consideration towards legislation, other requirements, significant aspects and any interested parties. This particular phase is about defining roles and responsibilities for the implementation and maintenance of the particular project. This operational control procedure is developed to secure each significant environmental aspect, each endangered safety, to minimize risk and make sure the project is maintained in accordance with the policies, objectives, targets, and legislation, during the whole implementation of the project. Then the Implementation-phase follows where after the final phase of the IMS project-cycle concerns the Monitoring-phase. This phase requires the supervision of the implemented measures. In short, this stage is about nothing but monitoring and measuring of the implemented measures.

To resume, within the IMS-approach, the Planning-phase involves amongst other things the identification and definition of the environmental aspects of a project. Thus to the extent of placing the research problem of the lack of cooperation with the implementation of *river management* development, it is this particular phase of the project management cycle in where the knowledge of this research project should contribute.

2.2.2 Implementation difficulties

As mentioned several times, one clear cause of the implementation difficulties can be found in a defensive posture of landowners/landusers, which manifest itself in lack of cooperation (opposition). In general the necessity of *river management* measures is well accepted, and supported[3], but there will be always something like a public interest contradicting a self-interest – a '*Not in my backyard*'-attitude (NIMBY) – which utterly may result into this kind of opposition (e.g. Knippenberg et al., 2003, p.6; Werf, 2003, p.149; Struiksma et al., 2008, p.7; Neuvel & Knaap, 2010, p.10; Groot, 2012, p.8). It is this kind of opposition that makes the planning process of nature friendly shorelines – who are seen as one of the more adequate measures to arrive at a higher ecological value, an thus higher surface water quality – complex and long lasting processes. And thus impacts the *effectiveness* of the river management planning process negatively. To the extent of the phenomenon of NIMBY, in this research project the following definition is used: "*NYMBI refers to a local undesired change of land-use or zoning of a land-plot, which because this change is expected to cause burden or nuisance* [translated from Dutch]" (Spit & Zoete, 2009, p.189). Regarding the in this definition mentioned *'burden'* this research project takes the dichotomy of public interest versus private interest (thus property related) as a starting point (obviously in the context of this research project, which is *river management* development). Furthermore, to the extent of the mentioned *"nuisance"*, one should think of, amongst other things, claims on property but also fear for the lost of values (e.g. cultural historical- and nature preservation values). Both aspects, *public vs. private* and *lost of values* are assumed to be a dominant input for opposition. And as mentioned earlier, opposition inherently leads to lack of *cooperation*. To conclude, this opposition can even become an obstacle to meet assignment (e.g. by the ICPR or EU). To that extent the first sub-question of *"What makes the river management planning process less effective"*, results into the first assumption of this research project *"a dominant factor in the time overrunning problem is caused by opposition by the involved actors"*. Shortly, the above mentioned literature – which in fact represented just a small sample of the total body of literature on this topic – gave rise to make the first assumption.

2.3 Considerations

As previously mentioned, to the extent of difficulties to *river management* planning processes, one can more or less state that a majority of these difficulties relate to the fact that a water manager gets involved in land-use planning. Or better said, the water manager interferes within the field of land-use planners. This already has proven to be not a simple exercise (Hartmann & Spit, 2012, p.98). This chapter covers the *considerations* on the present and possible future approach of the actual *river management* planning process in order to give an answer to the second sub-question on *"What causes this lack of effectiveness in the river management planning process"*. This exercise is done in order to arrive at a picture of the need for developing a theoretical framework that is going to give a possible solution in the stated research problem. To arrive at an answer to the second sub-question the first paragraph of this chapter regards – based on Hartmann & Spit (2012) – *some* dichotomies between these two mentioned fields of planning, with the aid of the "*types of legal aspects that influences modes of governance of spatial planning and water management*" (p.97).

2.3.1 Present approach

As mentioned in the *introduction* the water manager's task was traditionally very technical and consisted strictly the area between the dykes. Also Wiering and Immink (2006) amongst others, witnessed the transition within in flood management from building dykes (separating water from land use) to "*Space for the river*"-approach (p.423). To the extent of the specific issues on the modes of governance of spatial planning and water management who come with this transition. To resume these issues, in the hinterlands the water manager is no longer backed up by legislation (like e.g. Waterwet, 2009, art. 2.1, in the Netherlands; Hochwasserschutzgesetz, 2005, art 1, par 3a, in Germany). Thus as a consequence of the shift in legal situation, a water manger needs in many cases to acquire land for the sake of implementing river management measures – which is in fact the legal task of a water manager (e.g. the *Nationaal Waterplan 2016-2021*[4] [Policy by the Central Government, NWP] in the Netherland; the *Wasserhaushaltsgezetz* [German Federal Water Act, WHG 2009] in Germany; and the *Flood Management Directive* [2007/60/EC] by the European Union). So to that extent the *land acquisition* has become a eminent activity in the implementation process of the statutory river management measures.

To the extent of *land acquisition* strategies *land readjustment* and *compensation* are[5] traditionally the

most deployed *strategies* in order to gain the needed *Cooperation* for implementing the here discussed river management measures. Nevertheless experience wise these kinds of *strategies* do not necessarily guarantee willingness to *cooperate*. Of course one may expect the effectiveness of the *strategy* to increase as soon as the incentive becomes lucrative for the actors to *cooperate*. Yet within the scope of this research project, the stance of is taken that profit may never be the mechanism to gain *cooperation*. To conclude, *land exchange* and *compensation*, may not necessarily be the only key to realization of retention areas. So given the difficulties to stage *cooperation* from the involved actors one may consider whether the tools to arrive at this *cooperation* are the most *effective* or not? Within this research project the definition of the concept *effectiveness* stems from the core question: *"Is planning successful in achieving what it sets out to achieve"*. Effectiveness is seen as one of the standard criteria, which planners commonly use when evaluating a plan (Needham, 2007, p.247).

With regard to the demarcation of this research project it's important to emphasize that the scope of the aspect *Cooperation* focuses only on *land acquisition* for the sake of the implementation of river management development. Another important starting point is that the option of expropriation, as a solution for the river management implementation difficulties, remains completely outside the scope of the research project what so ever. It can be rightly stated that this instrument could be a mindset in terms of resolving the mentioned implementation issues. However, *"Questions of expropriation have repercussions in both public and private international law; they also bring out fundamental clashes of juristic theory"* (Wortley et al., 1947, p.25), and thus considered belonging to the field of Law. Though the field of Urban and Regional Planning does consider property rights (e.g. the Planning, Law and Property Rights[6] theme) this research project leaves it out of its scope.

2.3.2 Possible future approach

So if one takes the core question of the *Effectiveness*-planning theme as a point of view for this research, one can resume that the planning of river management development is not successful in achieving what it sets out to achieve, or better said not fully *effective*. This might be a bold and over exaggerated statement, but ICPR example[7] that was the trigger for this research project is exemplary, so the statement holds at least a certain truth. To improve on this issue of *Effectiveness* this research project is trying to find answers in the cause of these problems within the *Collaborative*-planning theory (e.g. Healey, 1997) and *Participatory*-planning theory (e.g. Innes & Booher, 2000). This starting point comprises in fact the second assumptions, which have been discussed in the paragraph *Aim of the paper*, and is in fact the most important assumption of this research. This assumption stems from the idea that one of the possible gaps within the process of river management measures might be the fact that participation, like e.g. the involvement of *worldviews* and *cultural biases* into the planning process in order to convince and gain trust, is currently not fully exploited. Since the introduction of European directives, like the *Water Framework Directive* (2000), there is a growing body of literature on participation within the scope of water management (e.g. Mostert, 2003; Enserink & Monnikhof, 2003; Bouwen & Tallieu, 2004; Tippett et al., 2005; Newig & Fritsch, 2009). So considering the different types of participation conceptualized by the *Ladder of Citizen Participation* (Arnstein, 1969), and the just mentioned body of literature, an exploration of civil involvement it is not completely unjustified. A prominent element in this research project will be the investigation, to what extent civil involvement can be a fruitful addition to the current planning process of river management measures. The assumption then will be that "*civil involvement enables the process to hook on to different perceptions and perspectives"* (appendix A). The *Oxford Advanced Learners Dictionary* (2010) describes *Perspectives* as "*…a particular attitude towards …*" or "*…a way of thinking about…*" (p.1132), and *Perception* as "*… an idea, a belief or an image you have as a result of how you see or understand*" (p.1126).

To conclude, the traditional *land acquisition strategies* within the river management policy are not sufficiently able to respond to the different beliefs – towards the measures – and different attitudes towards *land acquisition*. So to a certain extent, it is expected that the cause of the *research problem* lays in the fact that there is a lack of strategies to respond to the different perceptions and perspectives of participants and landowners within the current river management policy. To the extent of the second sub-question of *"What causes this lack of effectiveness in the river management planning process"*, in this research project it is believed that the *"inability to respond to the different perceptions and perspectives"* causes this lack of effectiveness. This resulted in to the second assumption "that a consensual approach – to hook on to different *Rationalities* – will utterly be an improvement for the planning process".

2.4 Cultural Theory

In this research project it is stated that difficulties regarding the research problem, of lack of cooperation, are caused by the fact that not always the right path of communication towards the actors is followed. Another important point of departure in this project is that actors are not seen as a homogeneous group, but rather as individuals who have certain rationalities. The assumption is made that *"That communication – in the form of appropriate incentives – can increase the chance on consensus with regard to the planning of river management measures, and thus increases the effectiveness of the planning process"*. As already emphasized before, the overall aim of this paper is to establish a concept that is able to contribute to the understanding, analyzing and reacting on the research problem of the lack of cooperation with the implementation of public works development. This chapter should specifically contribute to the understanding by giving an explanation on how this lack of cooperation causes. This explanation is based on the theoretical framework of Cultural Theory. The whole chapter is written in order to arrive at answers to the third sub-question on *"To what extent do the mechanisms of Cultural Theory explain the lack in Cooperation with the current is the river management planning process"*. This suggested theoretical framework is mainly derived from the authors *Schwarz* & *Thompson* (1990), and *Thompson et al.* (1990). This theoretical framework will be further referred to as *Cultural Theory*. Other authors who have been considered are *Douglas* (1999) and *Verweij* & *Thompson* (2006). Although both as backup literature.

2.4.1 Framework

With writing *Divided We Stand: Redefining Politics, Technology and Social Choice* (1990) *Michiel Schwarz* and *Michael Thompson* set the conceptual model for *Cultural Theory*. This theory is in fact a conceptual framework (figure 2.1), which seeks an explanation for social conflicts by distinguishing four different rationalities, and considers them. In this research project, it will be claimed that such a structure of social organization – the framework of different rationalities – can be deployed to analyze the *perceptional* issues who come with the implementation of *river management* measures. One of the, for this research project, important features of *Cultural Theory* is the classification of competitive structures in the social organization of society. According to *Schwarz* & *Thompson*, within societies, a classification of groups can be created along two dimensions, namely the dimensions of *group* and *grid*. These dimensions yield in a classification of four categories, namely *high group* and *low group*, *high grid* and *low grid*. A *high group* shows a high degree of *collective* control while a *low group* shows an emphasis on individual *self-sufficiency*. The *high grid* represents a clear *hierarchical* stratification, thus a more top-down structure, whereas the *low grid* rather stands for social *equality*. Within *Cultural Theory* these four categories are labeled into social attitudes (rationalities) better known as *hierarchy*, *individualism*, *egalitarianism* and *fatalism* (*Schwarz* & *Thompson*, 1990; Thompson et al., 1990; Douglas, 1999). Each of these rationalities comes with a certain set of characteristics and values that can be attributed to the different *perceptions and perspectives* of the actors that are involved in the *river management planning process*. Considering the aim of *testing potential effectiveness of strategies* it's evident that the aforementioned *perceptions and perspectives* are a clear part of the problematic implementation process of *river management measures*.

As mentioned in the former section *Cultural Theory* comes with a conceptualization of typical rationalities within a clear framework, which is visualized in *figure 2.1*. For a more detailed explanation on why the four different rationalities are located in their quadrant of this particular framework, the paper *Four cultures: the evolution of a parsimonious model* (1999) by *Marry Douglas* is recommended. For the sake of this paper only the very rudimental features which comes with the four rationalities, are discussed in relation with the *river management planning theme*.

Hierarchy: From a *hierarchic perception* the environmental circumstances – within a defined spatial area – would be stable. Which can be visualized[8] by a ball in a pit on top of a hill. So to say the ball in that pit must be seen as an analogy for a stable position, but it can be pushed over the edge, and then it roles of the hill. Which, translated to spatial circumstances would imply that the environmental consequences will be irreversibly. To prevent the environmental circumstances from pushed over expert knowledge should be applied to determine the boundaries of this pit. "*A rational way of doing this is to set up rules and regulations*" (Hartmann, 2012, p.248). So to that extent *hierarchists* are characterized by advocating a high degree of collective control – rules – and a clear social stratification. This is due to their *perspectives* of a spatial area, which find itself in a stable environmental circumstance, but the effects of interventions – in this project *river management* measures – may push these circumstances over a certain acute limit. Once that happens the effects of those interventions will cause an irreversible impact on the environment. This implicates that a *hierarchic* actor fears the loss of control regarding the results of the *measures* – so to say the outcome of the planning process. Regarding the process itself, a more bureaucratic attitude might be appreciated, "*Correct procedures and discriminated statuses are supported for*

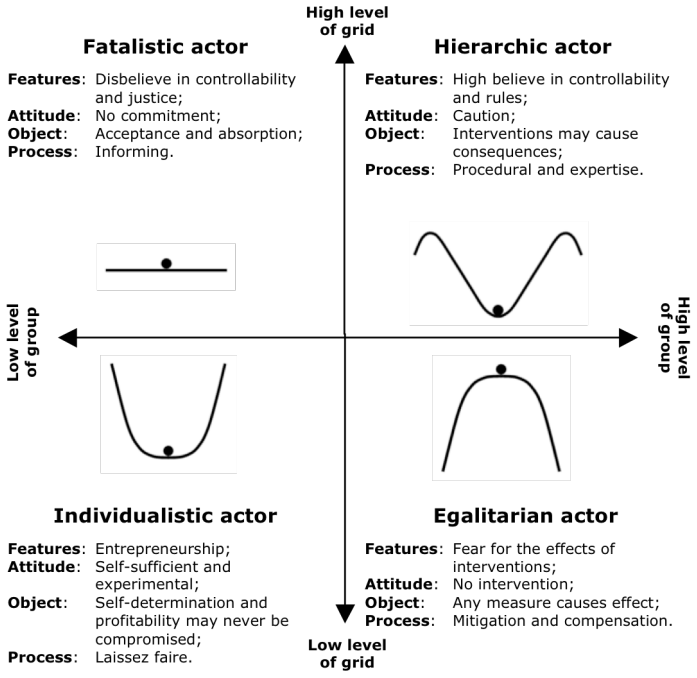

Figure 2.1. Framework Cultural Theory

own sake" (Schwarz & Thompson, 1990, p.67). *Cooperation* with river management devlopment might only be accepted if a well-founded plan is presented, the compensation must be founded in equality and based on expert-valuation;

Egalitarianism: In an *Egalitarian perception* the environmental circumstances of a spatial area are fragile. Following such a *vision* the spatial environment will react to any intervention what so ever, and it will be undoubtedly irreversible. In case of the here used visualization, *egalitarians* considering the environmental circumstances like a ball lying on top of a hill. Which is an unstable position – when disturbed it will roll down the hill, and won't return to its position. This *perception* features a high degree of collective control, and it rather stands for social equality. One could say that an egalitarian would care more for the result of an action than for the process. From this view "*…moral responsibility are reasons for taking action; equality, democracy and community are higher values than individual liberty*..." (Hartmann, 2012, p.247). So in that sense, *river management* measures are – in the *perspectives* of an *egalitarian* – seen as a treat for the environmental condition of the area. The *egaletarian* actor expects catastrophic and irreversible outcome of the planning process. So regarding the process, rejection and deflection might be expected, thus persuasion is the most appropriate approach*. Cooperation* for *land acquisition* might only be accepted if mitigation, compensation measures or environmental improvement is offered in return (Schwarz & Thompson, 1990, pp.66-67).

Individualism: The *individualistic perception* on the environmental circumstances of that same spatial area is resilient. Within this view the spatial environment may react to an intervention, which can be visualized by pushing a ball up on a hill. After let it lose it will automatically roll down the slope, back to its initial position – which implicates that an intervention will never result in permanent damage to the environment. Another important feature of this *perspective* emphasizes on (individual) self-sufficiency. So to say, self-determination and individual liberty are important values in an *individualistic perspective*. "*For planning, individualism advises neoliberal schemes, but experimental approaches are also welcome*" (Hartmann, 2012, p.247). Regarding the *individualistic perception*, *river management* measures are permissible, but with an addition that individual freedom, self-determination and profitability, will never be compromised by them. Thus the *individualistic* actor has an opportunistic attitude towards outcomes of the planning process. Regarding the process itself, the laissez faire attitude might be the more appreciated approach. So only if there is to a certain extent an advantages to be gained, *cooperation* for *land acquisition* might be accepted (Schwarz & Thompson, 1990, pp.66-67).

Fatalism: In the *fatalistic perception*, environmental circumstances of a spatial area are not in their sphere of influence. Illustrated by the ball analogy, the ball would lie on a flat landscape – a disturbance to the ball cannot be influenced. *Fatalistic perspectives* are featured by disbelieve in controllability and in justice. "*This rationality neglects planning …*" (Hartmann, 2012, p.248). Regarding *river management* measures, one might not expect any commitment. The *fatalistic* actor has an attitude of acceptance and absorption towards the outcome of the planning process. So regarding the process itself informing is rather important than persuading. The same holds for the *land acquisition*-procedure (Schwarz & Thompson, 1990, pp.66-67).

2.4.2 Contextual attitude

As the focus of this research project is on the implementation of *river management* development the considerations of rationalities are done in a context of surface water quality. To the extent of this field within *Public Work development* certain specific aspects serve the input of the attitude of actors. What is mend here is the fact that a certain context – like the context of surface water quality in this case – generates certain actor's rationality towards the specific aspects that come with that context. But it is not said that the same actor will have by definition the same rationalities in a different context, e.g. in the context of refugee asylum. To that extent rationalities could be seen as "*approaching forms of culture from the standpoint of everyday life and its observable artefacts"* (Rayner, 1991, p.2; Douglas, 1990, pp.413-415). The input on the rationalities of actors in the context of healthy surface water are amongst other things the aspects of 1) profitability, 2) environmental danger, 3) controllability for active rationalities and 4) inconspicuousness for passive actors (Hartmann, 2011, p.15; Schwarz & Thompson, 1990, p.12).

1) The aspect of profitability relates to the fact that the actor/land holder of the, for the implementation of river management measures, needed land sees the area as an place for investment and gaining profit (Hartman, 2011, p.16);
2) The aspect of danger relates to the fact that the actor/land holder of the, for implementation needed land, sees the area as a place of risk. Risk in this context can be related to various aspects, amongst other things risk towards, the consequences of climate change (e.g. DeCanio, 2003, p.12; Gore, 2006), towards economical risk (e.g. Schwarze & Wagner, 2007; Schwarze et al., 2011), but it can also relate to the risk of lost of natural value (e.g. Kareiva et al., 2007, p.1866; Nienhuis & Leuven, 2001). Note that there is an extensive body of literature on all these aspects of risk to that extent the here cited literature is just a random extract;
3) The aspect of danger relates to the fact that an actor/land holder sees the area as their responsibility with regard to water quality. For example as a result of legalization in case of water managers due to the Water framework Directive (2000/60/EC), by the European Parliament and of the Council (2000); a directive *"good status" for all ground and surface waters'*; and
4) The aspect of inconspicuousness relates to the fact that an actor/land holder sees, due to a lack of awareness, surface water quality as one of many relevant topics for spatial planning, but not more or less important than others (Hartman, 2011, p.12).

Regarding the sub-question on *"To what extent do the mechanisms of Cultural Theory* explain the *Lack in Cooperation with the current is the river management planning process"*; in this project the stance is taken that difficulties with reference to the research problem, of lack of cooperation with *river management measures* are a product of 1) different *perceptions and perspectives* on the effect of the measure (pluralism), and 2) a contextual attitude towards the necessity of the measure. The reason why the *mechanisms of Cultural*

theory are able to explain the lack of cooperation is found in the fact that it is based on plurality. This framework acknowledges the fact that actors are not a homogeneous group, but rather individuals who have these *perceptions and perspectives*. And even more importantly, the framework gives insight in why these different *perceptions and perspectives* are dismissive towards specific measures, and thus interfere the *effectiveness* the river management planning process.

2.4.3 Complementary

In this research project it is claimed that the chapter summed aspects to a certain extent can be linked to a specific land-use. This is a bold claim, which needs to be proved by experiment. To do so this claim will be his demonstrated in the next phase of this research project. This paper should be seen as the first phase to take in the deductive path the research project follows; the setting of a theoretical framework (Bryman, 2012, p.24). The next phase on this path will be to include this statement in a set hypothesis that can be tested. But this procedure will be the scope of the phase that follows after this one.

2.5 Conceptualization

This chapter is dedicated to last sub-question of this paper, which is: "*How can Cultural Theory contribute to the effectiveness of a future river management planning process"*. A sub-question that is in fact a direct derivative of the second part of the (research) question this paper seeks to answer for. Namely, "*How can Cultural Theory contribute to the effectiveness of the planning processes*". This specific chapter elaborates the concept that is developed to serve as an operationalization of the previous explained *Cultural Theory*, an exercise done in order to improve on effectiveness of *river management* planning.

2.5.1 Conceptualization

The conceptual model (figure 2.4) that represents a synthesis of the previous elaborated theory, is called the *"Prism"*-concept, and it links the before mentioned *rationalities* towards *cooperation* trough the use of *communication*. In a sense that these three aspects serve the model as phases in a *land acquisition procedure* during the process of the river management project cycle. The different types of *rationalities* are just elaborated; the lack of cooperation for river management measure regards the actual research problem; and the aspect *communication* refers to the research aim of *testing the effectiveness of strategies that meets the actor's perception*. So to say the concept should demonstrate the assumption *"That Communication – in the form of appropriate incentives – can increase the chance on consensus with regard to the planning of river management measures, and thus increases the effectiveness of the planning process"*. The concept, visualizes how a divergent flow – which represents the differing *perceptions* – in the planning process is transferred into a convergent flow by flowing through three phases, namely the "*Rationality"*-phase, the '*Communication'*-phase, and the "*Cooperation"*-phase.

To start with the first phase, the concept assumes that the actors involved in a river management planning process are not a homogenous group. They should rather be seen as a bundle of different *archetypes* – like a beam of light. A beam of light appears to be white, but it actually consists of a combination of all visible colors. The same holds for the bundle of actors within a planning process – such a bundle consists a variety of diverging *perceptions and perspectives* on how to use their spatial area. In this model *Cultural Theory* functions like Newton's Spectrum (1672). When the bundle of actors is passing through the analysis of *Cultural Theory*, this bundle becomes decomposed into different *rationalities*, distinguished by their *worldview* and *cultural biases*. So to say, this (first) *'Rationality'*-phase of the concept exercises the disclose of a hidden divergent flow within the planning process; a divergent flow, which may result in the stagnation of a planning process.

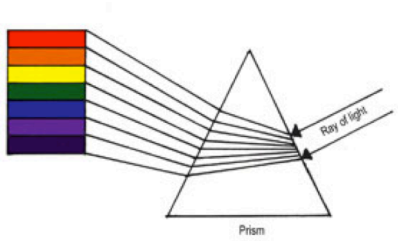

Figure 2.2. Newton's Spectrum

In order to deal with this divergent flow, the 'Communication'-phase is introduced to the concept. After the decomposition by *Cultural Theory*, it becomes clear that actors have, due to their *perceptions*, different objectives. The concept visualizes this phenomenon by showing different angles to the flows of these different *perceptions* – just like the (slightly) different exit angles of each color in a spectrum. This (second) phase is about *communication* because the concept tries to interact on the specific *perceptions* of different *rationality types* of actors. Literally *communication* means, the "*….process of expressing ideas and feelings,….*" (OUP 2010, p.301). To that extent the phase stands rather for the *process* of interacting on the *expressed ideas and feelings* of the actors. As the visualization of the flow chart makes clear, there are a variety of perceptions within the planning process, in much literature this phenomenon is known as pluralism. This phenomenon will cause inherently a difficulty in the process, because reflecting on just one of these *perceptions* means fore filling the demands of a certain *rationality type* of actor, but at the same time it implies neglecting other *types* of actors.

Before further elaborating on the conceptual model it is important to take a small glance into some important publications on planning theory first. This is done in order to give some insights into the development of the for this research project important, post-industrial Planning Theory. It also gives a clue on why making an analogy towards Newton. The core of this way of reasoning stems from literature by the authors Rittel & Webber (1973), Baum (1977) and Forester (2004). Which is all literature that seeks answers to the question: *"What is the Role of Theory in Planning?"* This literature is important because it emphasizes on the fact that planning is inseparable from a certain worldview. Already in 1973, in their fundamental paper *Dilemmas in a General Theory of Planning*, Horst Rittel and Melvin Webber mentioned that the types of problems planners are faced with (social problems) are fundamentally other problems than what engineers, until then, had to deal with. In continuation to the Rittle & Webber publication Howell Baum mentions in the paper *Towards a Post-Industrial Planning Theory* (1977), amongst others: *"Rationalism loses effectiveness as a guide to social*

action because it leads to fragmentation of the experienced world" (p.401). This can be interpreted as a reference to the challenges of the pluralistic reality for planning. To a certain extent the paper emphasizes on the fact that embracing social conflicts is necessary for the performance of the now a days planning tasks. Or better said that a planner can no longer ignore the pluralistic social reality, which implicates that actors cannot longer be seen a homogeneous group. And then John Forester explains in the publication *Reflections on teaching planning theory* (2004), that planning theory actually does not come up with abstract solutions to a problem; it rather provides a way world view.

> *"Planning theories provide 'frames' and 'lenses' through which overview problems,..."* (Forester, 2004, p.244)

A for this research project important lesson of the paper by Forester is that theorizing on planning stems from someone's contextual background, which implicates that considerations are based on perceptions and perspectives. Or more popular said, one sees and categorizes the spatial world through some lenses. This inherently comes with the risk of having blind spots. Therefore, in this research project is based on the philosophy that it is better to incorporate different worldviews within a planning process.

2.5.2 Mechanism of the concept

In this research project it is believed that perceptions and perspectives influence the preparedness of actors to cooperate with the implementation of *river management measures*. To that extent it is amongst other things assumed 1) *"That a consensual approach – hooking on to different actor Rationalities – will utterly be an improvement for the planning process of Public Works in general and specifically on the planning process of river management projects"*, and 2) *"Communication – in the form of appropriate incentives – can increase the chance on consensus with regard to the planning of river management measures, and thus increases the effectiveness of the planning process"*. This implies that if only the traditional incentives will be deployed in order to achieve the purpose of land acquisition, one only reaches out for a specific rationality type of actors. But these *incentives* might not be able to reflect on the *perceptions* of every *type* of the rest of the actors and thus will their *perceptions* continue to convert from the planning process, instead of getting back inline with the planning process. It is assumed *"that a dominant factor in the time overrunning problem with river management projects is caused by opposition by the involved actors, because of the lack of cooperation that inseparably comes with such opposition"*. Thus in order to transform a converting flow of all the prevailing *perceptions* within in the planning area, there need to be a range of *strategies* instead of just the traditional two incentives. In order to transform the diverting flow into a converting flow back to a straight path[9] along which a planning process is running reflection on all the *perceptions* should be exercised. If one consults the *Oxford Advanced Learner's Dictonary* (2010), *Reflection* stands for *"a sign that shows the state or nature,…"*, but it is also refers to *"the action or process of sending back light, heat, sound, ect. …"* (p.1278); like mirrors or lenses do, so to say. As this thesis is about the social phenomenon of pluralism instead of light reflection, reflection in the conceptual model is performed by a *strategy* instead of an actual lens. So a lens in this sense is meant as a strategy on *"how theory can be practical"* (Forester, 2004, p.244). Or in more exact words, reflecting on the theoretical division of actors made by Cultural Theory, in order to arrive at a practical approach of breaking up with the lack of cooperation; the problem that is assumed to be a *"dominant factor in the time overrunning problem with river management projects"*.

In general a *strategy* is defined as *"A plan that is intended to achieve a particular purpose,…"* (OUP 2010, p.1528). Yet, in order to serve this project a *strategy* is defined as *"a process of reflecting on the nature of specific archetypes of actors"*. *"Reflecting on the nature"* is seen as using specific *incentives* that fit the *perceptions* of specific actors in order to change their attitude. Thus in order to converge the flow, the concept reflects on a *perception* like a lens would reflect a ray of light so to say. It does so by administrating a *strategy,* which reacts on that specific *perception*, by an *incentive* that fit the nature of that specific *perception*. The same holds for perspectives.

The final phase of the concept involves the *Cooperation phase*, which actually is visualized by a divergent flow towards for the implementation of river management measures needed *land acquisition*. In fact, as soon as all the actors cooperate in the *land acquisition* procedure they will transform into ordinary actors again – the *rationality type* is no longer relevant for the planning process, and the flow of the planning process will run once again along a straight path.

To resume the here elaborated concept is meant as an operationalization of Cultural theory. It is in fact a composition of the two theoretical frameworks by both *Schwarz & Thompson* (1990) and *Forester* (2004), organized into a model from the natural sciences, namely Newton's Spectrum (1672). This set-up is chosen because the formation of Newton's system actually works in the same way as the (theoretical) components that, according to this research, explain the research problem of the *lack of cooperation* with the implementation of *river management* development. In that sense, the concept is developed as an experimental setup which is built up from the (theoretical) components of: 1) Cultural Theory and 2), the Lenses who are mentioned by *Forester*.

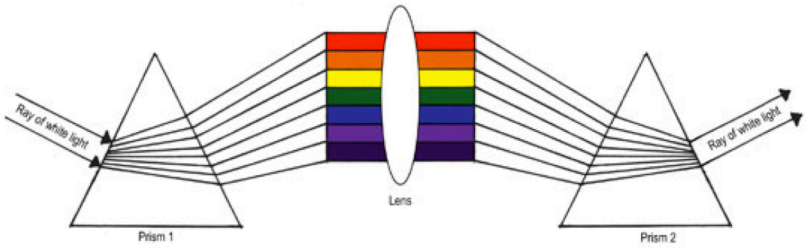

Figure 2.3. Newton's converging lens

To the extent of the sub-question *"How can Cultural Theory contribute to the effectiveness of a future river management planning process"*. The whole idea of the concept is that the model is an operationalization of three important theoretical

mechanisms who either explain or tackle the phenomenon that result in the research problem of *lack of cooperation for river management development;* the phenomenon of Pluralism. As pluralism is seen as the existence of different *perceptions and perspectives* next to each other, the mechanism of Cultural Theory helps to divide and label them into rationality types. This specific unraveling exercise creates the opportunity to respond more effective. So to that extent in this project it is claimed that *Cultural Theory is able to contribute to the effectiveness of a future river management planning process*, as it deals with the phenomenon that causes the research problem of *lack of cooperation*.

2.6 Conclusion

In order to come to a concluding end of this phase it is important to go back to the aim of the whole exercise, which initially was *"to establish a concept that is able to contribute to the understanding, analyzing and reacting on the research problem of the lack of cooperation with the implementation of public works development, with a focus on the river management projects"*. As mentioned previously the setup of this whole research project is based on a deductive approach and the theory behind the project is structured correspondingly the Euclides-model. Accordingly to that method of structuring the three for this research project important *assumptions* (axioms) are the starting point of the research project. In a reduced form these three assumptions can be summarized as: 1) That a dominant factor in the time overrunning problem of *river management* projects is caused by *opposition* (the research problem of *lack of cooperation*); 2) that a consensual approach will be an improvement for the effectiveness of the planning process of these projects (a direct link to the research aim of *improving on effectiveness*); and 3) that *Communication* (appropriate *incentives*) can increase the chance this needed consensus.

As the whole project will be done on the basis of a deductive analysis, the first stage of the research is to create a theoretical basis. This specific paper should give rise to that first stage of the project. To do so, firstly the research problem of the lack of cooperation with the implementation of *river management* projects has been outlined and considered in the chapters *Implementation difficulties* and *Considerations*. *Secondly* in the chapter *Cultural Theory*, theoretical considerations, with regard to the research problem, have been made in order to explain the phenomenon of lack of cooperation. These considerations where based on existing theory, which is *Cultural Theory*. The reason why *Cultural theory* is seen as a framework that is capable to explain the phenomenon is found in the fact that it is based on plurality. In this project the stance is taken that difficulties with reference of lack of cooperation are a product of: different *perspectives*, *perceptions*. Cultural Theory acknowledges these differences, and even more importantly, it gives insight in these differences. And finally in the chapter *Conceptualization*, considerations are made about how this existing theory can be operationalized into a concept for understanding and analyzing the given problem. The later is done in order to give rise to the, in paragraphs *Implementation difficulties* and *Present approach*, mentioned difficulties within public work development on the one hand, but more importantly, to arrive at possible a theoretical foundation of the problem within the field of river management *planning* which might improve the effectiveness of the implementation process, because it is capable to address the difficulties (that causes lack of cooperation).

The core (research) question this paper tried to answer was: *"What difficulties does the implementation process of "Space for the River"-measures bring, and How can Cultural Theory contribute to the effectiveness of the planning processes"*. On closer inspection this question contains two parts; a *"What"*-part and a *"How"*-part. To the extent of answering the *"What"*-part, the chapter *Implementation difficulties* concluded that with regard to the difficulties of the implementation process, Opposition by the involved actors is a dominant factor in the time overrunning problem. Thus Opposition, as in *lack of cooperation*, can be seen as an obstacle to meet assignment. The chapter *Considerations* comes to the

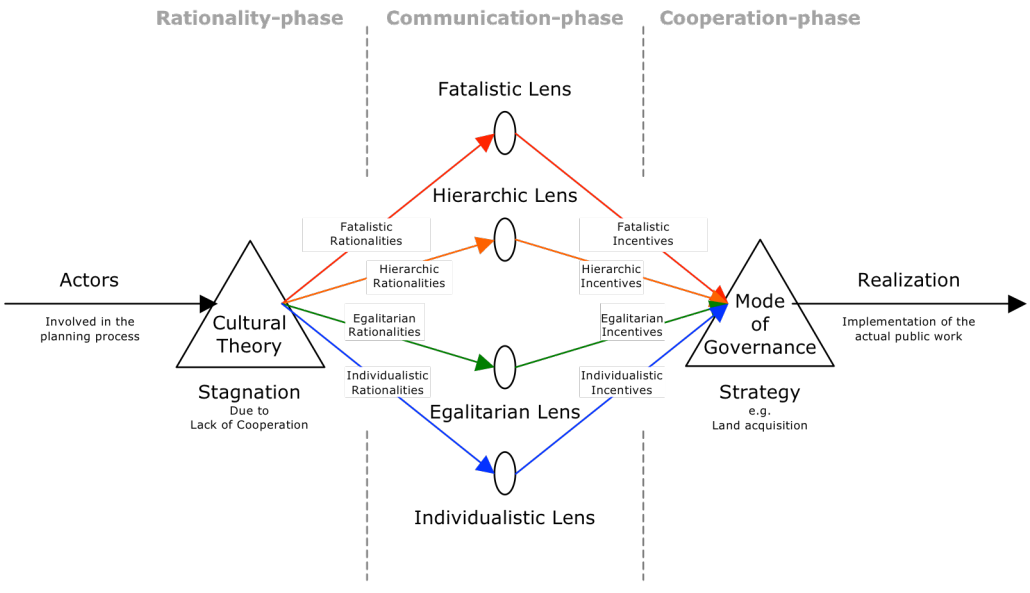

Figure 2.4. Conceptual model; "Prism"-concept

conclusion that the current strategies within the river management implementation process are not sufficiently able to respond to these involved actors; to the extent of their different beliefs towards the measures and attitudes towards land acquisition. An *inability to respond to the different perceptions and perspectives* causes this lack of effectiveness so to say.

With regard to the *"How"*-part, in this project the stance is taken that the theoretical framework of *Cultural theory* is capable to explain the lack of cooperation because of the fact that it is based on plurality. The framework not only acknowledges that actors are not a homogeneous group, but gives also insight into these *perceptions and perspectives*. However, to apply the theoretical framework to the implementation process of *river management* measures – the research object of this project – the framework is not yet entirely appropriate, to the extent that the framework gives answers the issues plurality, but there is till a gap in how to arrive at effectiveness with regard to the implementation process. In order to fill this gap the conceptual model (*"Prism"*-concept) is developed. In essence this model is an operationalization of *Cultural Theory* towards the river management planning process.

2.6.1 Resume

To resume, the in this paper elaborated conceptual model – the *"Prism"*-concept (see figure 4.) – is develop in order to solve stagnation within the implementation of river management measures. Ideally the implementation process would flows along a straight path trough the Planning-phase via a Preparation-phase into the Implementation-phase. The preparation-phase includes among others the aspect of *land readjustment* for the actual realization of the river management measures. In order to obtain the for implementation needed land, an often deployed *acquisition strategy* that is based on two incentives, namely *land exchange* or *compensation*. But due to the effect of *perceptions* and *perspectives* these incentives are not always sufficient, which results in unwillingness (lack) to *cooperate* with the *land acquisition* procedure; which results in a stagnation in the planning process. So to say the flow of the process does not fit all the *perceptions* and *perspectives* of the actors – *perceptions* on environmental circumstances within a defined spatial area and *perspectives* on how their spatial environment should be treated. The purpose of the conceptual model is to eliminate the stagnation and restore the flow of the process. The model tries to obtain that aim by incorporating three sub-phases into the process, namely a *Rationalities-phase*, a *Communication-phase* and a *Cooperation-phase*. The first *Rationalities-phase* is exercised in order to determine the different *archetypes* of actors within a planning area by dividing them based on their *perceptions* and *perspectives* – in a flow chart this can be seen as a convert flow because the ideas on how to plan the area are not in line with the planning process. In the following *Communication-phase* the model deals with these different *archetypes* by deploying *strategies* that reflect on their *perceptions* by the use of *incentives* that fulfill the specific demands that characterize their *perspectives*. In the flow chart the convert flow is reflected back into a divergent flow. This divergent flow represents the final sub-phase, namely the *Cooperation-phase* in which the land needed for the measure can be *acquired*. And at that point the process is back on its initial planned track to the realization of the river management measure.

2.6.2 Next phase

To a certain extent it can be said this research project claims that Perceptions and perspectives can be linked to a specific (rationality)type of actors – and in a later stadium even to specific land-use –, which are bold claims that needs to be proved by experiment. To do so these claims will be his demonstrated in the next phase of this research project. The next phase on this path will be to include this statement in a set hypothesis that can be tested.

Notes

1 International Commission for the Protection of the Rhine (ICPR): In 1998 the ICPR identified 13 retention areas to be implemented before 2020. Until to date only 3 of them are realized (appendix A);
2 Integrated Management System (IMS): One system that combines all the related components of a business in order to arrive at an easier management and operation (Sci Qual International, 2016);
3 This statement stems from Projectsteckbrief, *Akzeptantz für Auenlandschaften als Retentionsräume, Metthoden zum geselschafttliche Diskurs & zur Partizipation*, issued by the HKC on January 2015 (appendix A, p.1). Note that this Projectsteckbrief is in fact as the formal assignment of this research project (see also note 5);
4 National Water Plan: The National Water Plan is determined by the Minister of Infrastructure and the Environment and the Minister of Economic Affairs. The plan describes the main features of the national water policy and the corresponding aspects of national planning policy (Central Government the Netherlands, n.d);
5 This statement stems from Projectsteckbrief, *Akzeptantz für Auenlandschaften als Retentionsräume, Metthoden zum geselschafttliche Diskurs & zur Partizipation*, issued by the HKC on January 2015 (appendix A, p.1). Note that this Projectsteckbrief is in fact as the formal assignment of this research project (see also note 3);
6 The Planning, Law and Property Rights theme was amongst other things one of the tracks at the AESOP 2014 congress, held at Utrecht University from July 9th till 16th, 2016;
7 This statement stems from Projectsteckbrief, *Akzeptantz für Auenlandschaften als Retentionsräume, Metthoden zum geselschafttliche Diskurs & zur Partizipation*, issued by the HKC on January 2015 (appendix A, p.1). Note that this Projectsteckbrief is in fact as the formal assignment of this research project (see also note 3 and 5);
8 To support the description of rationalities, *Cultural Theory* makes use of schemes that draws a picture of a ball on a typical line. The ball would be a representation of the environmental world, where the line would be a representation of the actual *perception* characteristics of the world towards interventions (Thompson et al., 1990, pp.25–37);
9 The planning process is assumed to run along a straight line: *Planning-phase* via a *Preparation-phase* on to an *Implementation-phase*. Which translated to the river management planning process would flow from a Flood Risk Management Plan (*Planning-phase*) via a *Land acquisition* process (inter alia *Preparation-phase*) into the realization of the actual measure (*Implementation-phase*).

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Ch.3 The Methodology Experimentalizing Cultural Theory: *An experiment to prove Social Influence within River Management Planning*

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Abstract Virtually every major public work development within the railway-, groundwork-, road construction and hydraulic engineering (Infrastructure) sector has to deal with a difficult project-implementation process. One clear issue these kinds of projects have to deal with is the exceeding of time estimates (Flyvbjerg et al., 2004, Tiesman et al., 2009). With regard to the implementation of river management projects these kind of exceeding's are more a regularity than exception (e.g. assignments by the ICPR[1]). In this research project it is assumed that opposition by the actors involved in such projects, causes a dominant factor in the time overrunning problem. Opposition is meant here as lack of cooperation; an attitude that will not contribute to the likelihood of the implementation of that particular public work project. Such lack of cooperation is assumingly caused by the phenomenon of pluralism, in terms of differing perceptions and perspectives. In this research project it is stated that a deliberated communication approach could increase the chance on cooperation with the project implementation. The analytical framework of Cultural Theory, by Schwarz & Thompson (1990), is seen as an explanation for the phenomenon. This paper elaborates on the research strategy and methods of an experimental setup that, firstly should be able to demonstrate the influence of Cultural theory during the river management planning process, and secondly prove that a consensual approach – to hook on different actor Rationalities – will utterly be an improvement for the planning process.

Keywords
Cultural Theory, Communication, Cooperation, Experiment, Perspectives, Perceptions, Plurality, Rationality.

3.1 Introduction

The extreme floods in Central Europe (2013) caused flooding and damage in amongst others the South- and East Germany. Soon after this flooding event a discussion on the urging need for implementing sufficient flooding measures started. The discourse on this particular subject resulted in an overview of important practical issues with regard to the implementation of such projects. Two of those issues are of great importance for the initiation of this actual research project. Namely: 1) *The need for more space for the implementation of retention areas with sufficient storage capacity to handle even extreme high water*, and 2) *Current (civil) usage (and environmental effects) often blocks the realization of so called 'Room for the River'-projects* – in this project better known as river management measures. The latter issue describes as a matter of fact the actual planning problem. Because in general the necessity of that kind of river management measures is since 2013 well supported, but there will be always something like a public interest contradicting a self-interest – a *"Not in my backyard"*-attitude (NIMBY) – which utterly may result into fierce opposition, or in more understated terms lack of cooperation. However, the effect of such lack can make the realization of retention areas – which is believed to be the one of the most effective river management measures – a complex and long lasting processes. To conclude, this defensive posture can even become an obstacle to implement river management measures at all. So to say considering the aforementioned two issues, the underlying question which is led to the initiation of this research project would be *"How to stage cooperation for implementing these river management measures"*.

3.1.1 Starting points

The overall aim of this research project is to establish a concept that is able to contribute to the understanding, the analysis and to react on the just mentioned problem of Lack of Cooperation. The whole project will be done with the idea that this knowledge may contribute to the improvement of effectiveness of the planning process. In order to do so theory has been taken as a starting point for explaining the cause of the problem. To be more concrete, the application of a theory that stems from the 1990's is believed helping to make progress in the dead ends within the river management implementation processes; a dead end caused by lack of cooperation of actors within these kinds of implementation processes. This theory is referred as Cultural Theory and finds its foundation in literature by Schwarz & Thompson (1990), Thompson et al. (1990) and Douglas (1999).

One for this research project important starting point is that actors are not seen as a homogeneous group, but rather as individuals who have certain rationalities. The choice for the theoretical legacy of Cultural theory stems

from the idea that the framework gives insights into these different rationalities of the actors who are involved in the implementation process; rationalities who stem from individual perceptions and perspectives. Another point of departure to the extent of this research project is the statement that difficulties regarding lack of cooperation, are caused by the fact that not always the right path of communication towards the actors is followed. With regard to this statement the assumption is made *"that appropriate communication can increase the chance on consensus with regard to the planning of river management measures"*.

Together with the just mentioned assumption another for this phase important assumptions is "That a consensual approach – to hook on to different actor Rationalities – will utterly be an improvement for the planning process of public works in general and specifically on the planning process of river management projects". Along with the research problem these two assumptions led to a research that seeks to answer the (research) question of:

> *"What approach gives substance to theory, and How to encapsulate the concepts?"*

To arrive at an answer to the first part of that question, it is required to draw in a deductive way on the theoretical basis of the whole research project. This theoretical basis has already been discussed in detail during the prior phase of the project, and has been extensively reported in chapter 2 (pp.17-28). During this phase theory that gives substance to the research problem relate to the theoretical content of that specific paper. The second part of that question leads to the core of content of this phase, which is the elaboration of the conceptual model developed for this research project; the so called "Prism"-concept.

3.1.2 Concept

The in this chapter elaborated conceptual model – the *"Prism"*-concept (figure 2.4) – is in fact develop in order to solve stagnation within the implementation process of river management measures.

For investigating the potential effectiveness of strategies, the stance is taken that the "Prism"-concept is capable of supplying such effectiveness, by operationalizing the two important theoretical frameworks, namely: 1) Cultural Theory, and 2) The analogical "lenses" by Forester (2004). Either of these frameworks explain or tackle the phenomenon that result in the research problem; the phenomenon of Pluralism.

In the context of this project pluralism is seen as the existence of different perceptions and perspectives (rationalities) next to each other. The first framework (Cultural Theory) helps to divide and label these different perceptions and perspectives. The output of this exercise creates the opportunity to respond more concentrated and thus more effective to the now unraveled different rationalities. So in that sense in this project it is claimed that Cultural Theory is able to contribute to the effectiveness of a planning process of river management measures, as it deals with pluralism. The exact working of the theoretical framework of Cultural Theory has been put forth in the phase prior to this one. Cultural theory as applied in this research project is mainly derived from the authors Schwarz & Thompson (1990), Thompson et al. (1990) and Douglas (1999).

The second framework – or better said a theoretical legacy – is applied in order to respond on the divided actor perceptions and perspectives. By applying this philosophy, the pluralistic social reality will be no longer ignored. This specific legacy stems from the publication Reflections on teaching planning theory (2004) by John Forester, and it explains that planning theory actually does not come up with abstract solutions to a problem; it rather provides a worldview.

> *"Planning theories provide 'frames' and 'lenses' through which overview problems,..." (Forester, 2004, p.244)*

It is this analogy of lenses, which has been of great importance for the establishment of the conceptual model. Because a for the concept important point of engagement of this legacy, is that theorizing on planning stems from someone's contextual background. Which basically implicates at considerations should be based on perceptions and perspectives. Or more popular said, one sees and categorizes the spatial world through some lenses. Therefore, the "Prism"-concept is based on the philosophy that one should incorporate different worldviews within a planning process.

3.1.3 Aim of the paper

The aim of this specific phase is to establish an experiment that is able to test the *"Prism"*-concept, which is expected to contribute to the understanding, the analyzing on the research problem. Thus, the core of the phase is about experimetalizing the conceptual model by: 1) *Testing the claims of Cultural Theory*, and, 2) *Then testing the assumed lenses*, who are in fact an analogy for a multi communication strategy approach. An approach that includes multiple strategies who each concentrates on one of the existing actor rationalities within a river management developing area. The first test will be done in order to confirm the Rationalities-phase of that conceptual model, the second in order to prove that a multi-strategy procedure of the Communication-phase is indeed capable to gain cooperation for the implementation of river management measures, and thus is more effective. As the project is based on a deductive strategy the aim is to establish claims and statements by confirming hypotheses. In this phase the hypotheses and the data collection of the whole research project will be elaborated.

Specifically the data collection, research design and methods of the experimental setup that should confirm the claims and assumptions of this research project, are the scope of this phase. To be more concrete, the experimental setup should be able to test the concept in order to confirm the assumptions are set in this phase. The baseline of that exercise the following Hypotheses:

Hypothesis 1)	*"It's possible to classify types of actors (archetypes) based on the functions or land-uses of their plots, and generalize specific rationalities towards these archetypes";*
Hypothesis 2)	*"In a certain sense, one can assign specific perceptions to the previously established archetypes";*
Hypothesis 3)	*"In a certain sense, one can assign specific perspectives to the previously established archetypes";*
Hypothesis 4)	*"Each archetype has a certain sensitivity to particular incentives"*

Note that incase of pure fundamental science a deductive approach would also revise theory. But since this project is done in the context of applied science – after all the research is conducted on behalf[2] the HKC theory is applied instead of derived. So to that extent only hypothesis will be tested. The sub questions below are formulated in order to guide the experimental setup:

1) The 1st hypothesis will be investigated by the sub question: *"To what extent is it possible to generalize the residents of a certain catchment area to a standard set of archetypes?"*;
2) The 2nd hypothesis will be investigated by the sub question: *"Assumed that the population is to generalize archetypes, which perceptions goes with each archetype?"*;
3) The 3rd hypothesis will be investigated by the sub question: *"Assumed that the population is to generalize archetypes, which perspectives goes with each archetype?"*;
4) The 4th hypothesis will be investigated by the sub question: *"To what extent do the assumed archetypes exhibiting shared preferences towards certain incentives?".*

The whole idea behind the setup of these questions is that, once demonstrated the phenomenon of pluralism (questions 1 to 3), this knowledge will be administrated to test communication strategies who could respond to it (question 4); like a two stage-rocket so to say. The mechanisms of Cultural Theory refers in this sense to the features of perceptions and perspectives of the various (arche)types of actors within a planning process who cause pluralism. The tested strategies are formulated in such away they will anticipate to the (theoretical) characteristics of these rationalities. All in order to gain cooperation.

3.2 Research design

This chapter elaborates the research design (figure 3.1) of the project that is developed in order to facilitate the four specific analyses, which are the core of the whole research. The need for structuring has mainly to do with the fact that during the analysis hard registered facts, e.g. established zoning and land-use, is going to be associated with softer and more elusive facts like worldview and biases.

The explanation of the research design will be done on the basis of the elaboration of: 1) the particular data streams of the design, 2) the various data sources which have to provide input, and finally, 3) the methods of analysis of the data. These three aspects of the design are then themselves set into distinct components within that aspect in order to explain how the various indicators will be extracted and analyzed. The aim of this chapter is to contribute to: 1) *The reliability and replicability of the research*, and 2) *The validity*, in order to allow reflection with respect to, amongst others, the units of measurement.

3.2.1 Data streams

Basically within this research design there are three separate categories of data steams to distinguish, namely: 1) *Intrinsic data from the subjects*, 2) *Object related data*, and 3) *Data relating to preferences of subjects* and to that extent thus more *behavioral related*. Before elaborating the actual research design firstly the types of data are explained:

1) Subject related data: This data consists indirect indicators in a sense that these are all indirect measurements of concepts that are difficult to measure. Difficult because in its most essence it is about intrinsic subject-data, which must give rise to the more abstractly, formulated *"world view"* and

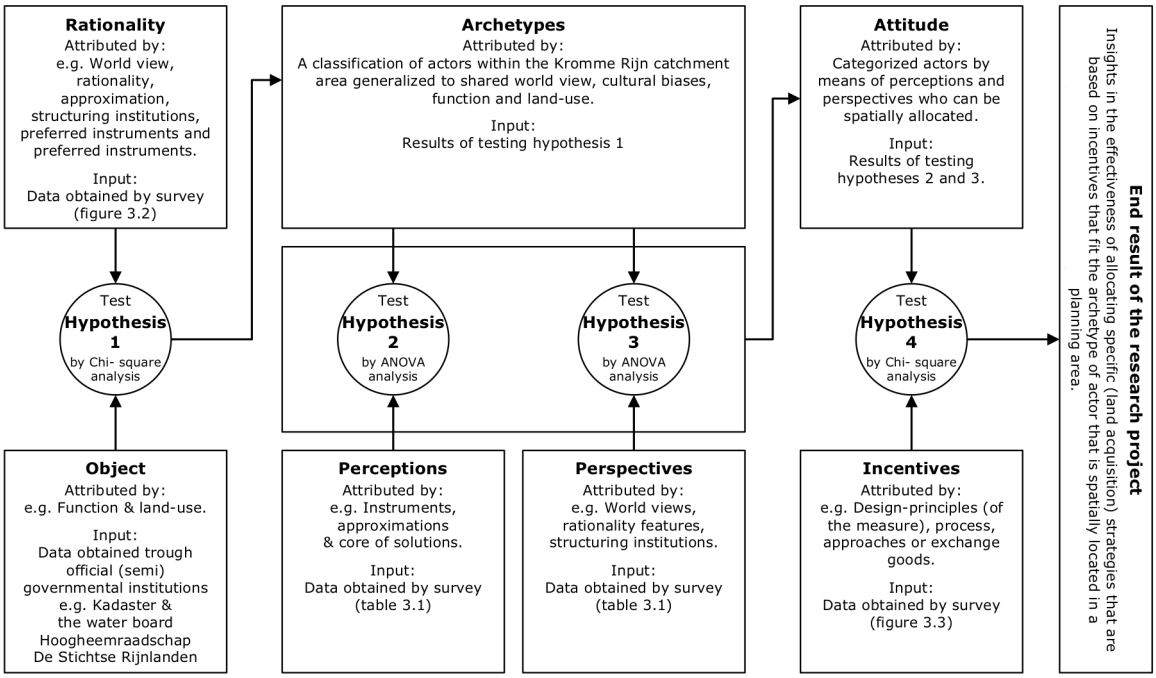

Figure 3.1. Research design

"cultural bias" to which the framework of Cultural Theory refers to. In this research approach the choice is made to encapsulate the (four) rationalities of Cultural Theory, into indicators. Indicators in the form of keywords. These keywords are assumed to represent the perceptions and perspectives of these four distinctive rationalities, by attributing e.g. world view, rationality feature, approximation, structuring institution and preferred solutions. Assumptions are of course highly susceptible to critical reflection, because it raises issues of measure validity[3] (e.g. Bryman, 2012, pp. 171-179). Amongst other things, whether the chosen keywords are: a) *Generic enough to be joined by anyone*, in other words an issue of clearness, and b) *These are rather an association of the author*, which is an issue of ambiguity. However, this set of keywords is a straight derivate of the literature by Schwarz & Thompson (1990) and thus left for that. Furthermore this study is an exploratory study. In that sense these risks are acceptable, but in a follow-up research the (re)formulation of indicators should be a consideration;

2) Object related data: This data stream consist facts related to the objects; facts who are officially registered and therefore undisputed;
3) Behavior related data: The last category of data is actually an extract of preferences. This extract is based on a pre-defined palette of incentives. Whether this palette covers the daily practice can be debated (regarding ecological validity, as in: Bryman, 2012, p.48), nevertheless the intended result is to make a distinction in preference. To do so, this palette of contrasting incentives has been developed against the background of the Schwarz & Thompson (1990), Thompson et al. (1991) and Douglas (1999) literature.

The above-mentioned data will be the input for different causality analyses. And although applied in different phases of the research design; these different data-features are essential to the demonstration of the "Prism"-concept.

The method of testing both Cultural Theory and strategies will be based on the principles of a quantitative research strategy. Especially the argument that the outcomes of quantitative research can be generalized makes this approach favorable for the assignment. Generalization is actually a prerequisite for the development of strategies, because the of degree effectiveness of a strategy is a straight derivative of the degree to which it covers the problems within an area. The probability that outcomes of one or two specific cases are areal wide representative is less likely then an areal wide conducted survey.

3.2.2 Data sources

The data itself is derived from two main sources, namely: 1) *Questionnaire survey*, in order to extract the subject data, and 2) *Institutionally recorded data* (among other things, in zoning maps and institutional databases), which provides the object data.

1) Questionnaire survey: This research tries to demonstrate an concept which is mainly based on social characteristics, so subject related data is a major input. In order to obtain this needed subject related data the choice is made to exercise a (self-completion) questionnaire survey as an instrument of data collection. This choice is made for the fact that a survey allows to take a huge sample in a short period of a population that is geographically widely spread. A large sample is required to ensure the external validity of this research. Applying structured interviews to such a large sample, in such a wide area, in such a short period of time would be almost impossible and furthermore very expensive. In general one of the disadvantages of a questionnaire survey relates to the fact that questions need to be clear and unambiguous (Bryman, 2012, p.234). However, the questionnaire-design of this research is mainly based on keywords (figure 3.2); this should at least deal with the clearness of the survey. The issue of ambiguity is already elaborated in the previous paragraph;
   Note: The same questionnaire survey deals with the collection of the behavior related data, but unlike the subject related data, this involves a standardized set of preferences. To the extent of issues of ecological validity this aspect has already been expound in the preceding section.
2) Recorded data: One of the aimed products of this project is to show the relationship between zoning/land-use (object related data), and the actors rationality (subject related data). In contrast to the subject-related data, the object related data and will be retrieved from the registering institutions. So in that sense, this data does not have to be extracted.

The questionnaire survey will be sent to the owners/users of the plots in a range of approximately of 50m both sides the shoreline of the researched catchment.

3.2.3 Methods of analysis

To arrive at answers to the set of research questions the research design is build around four analyses that are expected to underpin the conceptual model. As the model is based on three phases, so does the research design, where every stage has its own method of analyzing. Basically the research design follows the same division, as: 1) *Rationality-phase will be tested by Hypothesis 1*, 2) *Communication-phase is going to be tested by Hypothesis 2 and 3*, and 3) *Communication-phase is tested by Hypothesis 4*.

1) Test on Hypothesis 1 by Pearson's chi-square: One of the most fundamental aspects of this research is finding an association between the variable function/land-use of the land plots along the catchments and the variable rationality of the owner/users of these plots. Important is whether, and to what extent, these variables affect each other and how strong that association is. This specific method is chosen because both the data with regard to the function/land-use as the data with respect to the rationalities concern categorical variables. In order to gain knowledge on the association the first step of the examination will be a cross-table analysis on the association of the data gained by the questionnaire survey. After that exercise a Pearson's Chi-square test will be executed in order to determine the probability to what extent the association between the function/land-use and the actual rationality of the actor is a coincidence;
2) Test on Hypotheses 2 and 3 both by Analysis of variance: The next task will be to find out to *what extent certain archetypes base their rationalities on*

perspectives (hypothesis 2) and perceptions (hypothesis 3), *and which specific perception/perspective is typical for such an archetype*. The underlying ideas of these exercises are that these two factors are the basic for formulating incentives to gain cooperation. An important input variable for this test is the in test (1) obtained archetype of actor; a categorical variable. Both tests 2 and 3 are practically the same and will be done in order to demonstrate the Hypotheses: *"In a certain sense, one can assign specific perceptions, respectively perspectives, to the previously established archetypes"*. To get a global first picture on this statement the first exercise will be to create a frequency table that confront the operationalized perceptions/perspectives to the in test 1 composed archetypes. After that descriptive exercise an ANOVA test will be exercised in order to determine whether there are systematic differences between the different archetype groups regarding their perceptions/perspectives of the rationalities or that any differences are purely coincidental;

3) Test on Hypothesis 4 by another Pearson's chi-square: The final exercise is to find an association between the variable Archetype, done in the Rationality-phase, and the set of incentives.

As mentioned, all tests together describe the path of the conceptual model, and despite the fact that each phase of the model has its own analytical method; the tests do not stand alone. Each test depends on the results of the prior test. The research strategy must therefore also be seen as a solid whole rather than four separate tests.

3.3 Data collection

Following a quantitative research strategy the conclusion of the investigation will be intellectually based on figures. And to extract these figures the survey will be exercised amongst the actors who are involved in legal water task[4] related planning processes within the catchment area of the Kromme Rijn. Within the field of social science research the application of a survey is a common technique for collecting data. Such a survey is served by a questionnaire posed to a large number of respondents (Boeije et al., 2009, p.215). In case of this research project the primary objective of a survey is: 1) *To determine the distribution of the typical perceptions and perspectives within the researched areas*, and 2) *To extract on behavioral aspects* (preferences). In this sense the exercise refers to the large-scale gathering of a body quantitative descriptive data (at a certain moment in time with multiple variables), for the purpose of detecting patterns and relationships (a cross-sectional study).

3.3.1 Target population

The target population of this experimental setup, for whom the research is directed and for which the research wants to do pronunciations, are in fact the (potential) actors involved in the implementation of water task related projects (e.g. Flood Management Directive 2007/60/EC or Water Framework Directive 2000/60/EC). Which in fact means that measures will be planned on their land lots. The whole research project regards an experiment with the aim to test the operation of the two mentioned theoretical claims to the extent of the actor's readiness for cooperation with the

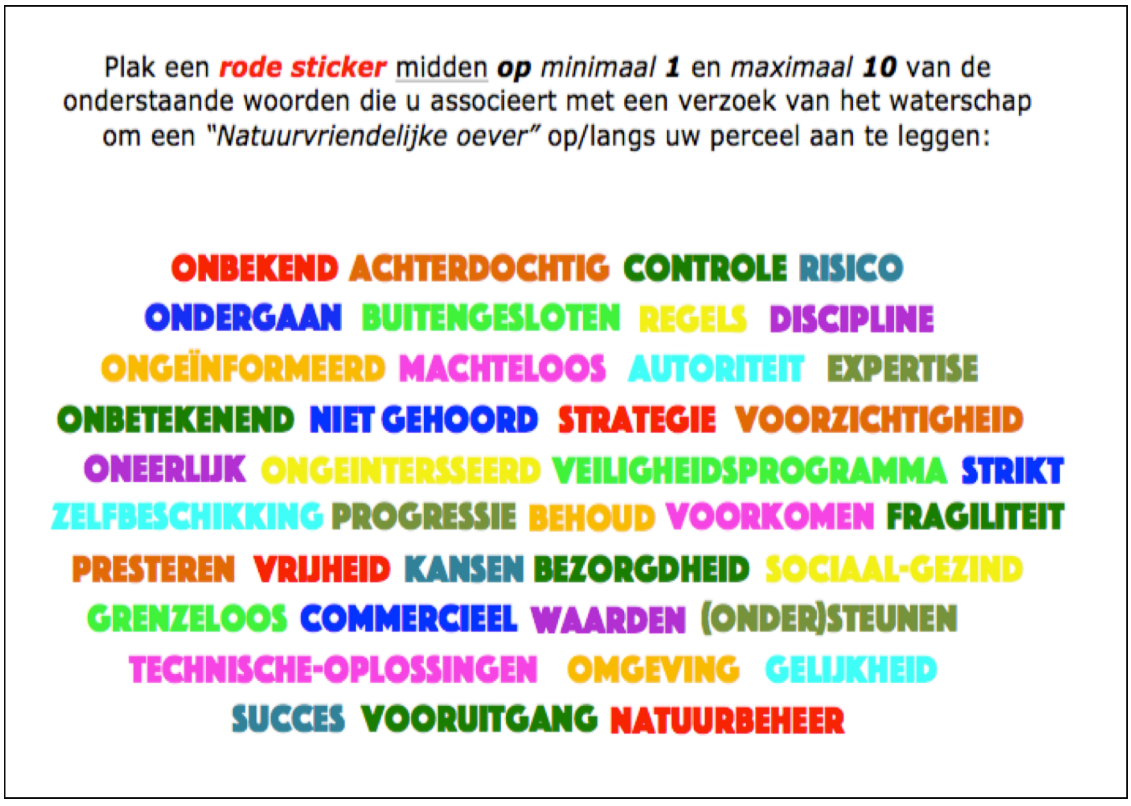

Figure 3.2. Survey to extract on rationalities, perceptions and perspectives

implementation of such measures. So in order to apply this test, a catchment area that is subjected to that kind of measures has been selected, namely the catchment of the Kromme Rijn. A chatchment that is subjected to the Water Framework Directive (2000/60/EC).

The demarcation of the population, who will be tested in the experiment of this project, is based on the potential chance of becoming subjected to such water-task legitimized measures. The exact operationalization of this target population is formulates as follows:

> *"Owners of land plots which lie in a range of 50 meters from the shoreline of the Kromme Rijn"*

As becomes clear from the wording of this target population, the research focus only on the owners; thus the operational population of this research regards only property. With regard to reality this certainly is an unjust demarcation, as in a real situation opposition (lack of cooperation) may as well come from users (e.g. lessees and tenants). So to that extent the operationalization fails to cover the factual population of actors who's cooperation is needed to implement measures. However this distinguished consideration is done reasoned from a time/cost perspective, because institutions like the German *Grundbuchamt* and the Dutch *Kadaster* provides a uniform and easy accessible register of real estate units. Related to the fact that this study is initiated as an exploratory research[5], just testing the theoretical mechanisms on a demarcated fraction of the total population is considered as sufficient. This statement is obviously prone to reflection.

To the extent of the chosen 50-meter zone, this consideration is purely based on practical thoughts. For convenience, it is assumed that landowners within a 50-meter zone will feel involved in river management. In this sense, it is expected that interviewees can identify themselves into a hypothetical situation in which their property will be a subject to implementation of a legal water task related measure.

3.3.2 Postcard survey

In a certain way the whole research project features a risk with regard to data collection. More concrete, if the whole data collecting exercise will not succeed the project faces failure, as it will not be able to prove the statements in a quantitative way. The pith of this matter will lay in the risk of non-response.

Nonresponse is a well-known risk when doing (self-completion) quantitative research by survey (e.g. Bryman, 2012, pp.199-200; Boeije et al., 2009, p.230-232; Vocht, 2014, pp.207-208). It is expected that a survey that is being propagated with a long list of merely questions, the response will be low. Therefore an alternative method is chosen for this project to replace the traditional questionnaire survey, by a specially designed postcard. This postcard survey will contain a front side with 1) *Keywords* that should be checked (figure 3.2), and a backside with an enumeration of 2) *Pre-defined incentives* from which one should be picked (figure 3.4). The idea behind this configuration is:

1) Keywords: In order to distill the rationalities the front side of the postcard will contain a cloud of keywords, from which the interviewee should choose (figure 3.2). These keywords represent indirect indicators in a sense as an indirect measurement of the abstract concepts of *"world view"* and *"cultural bias"*. Basically

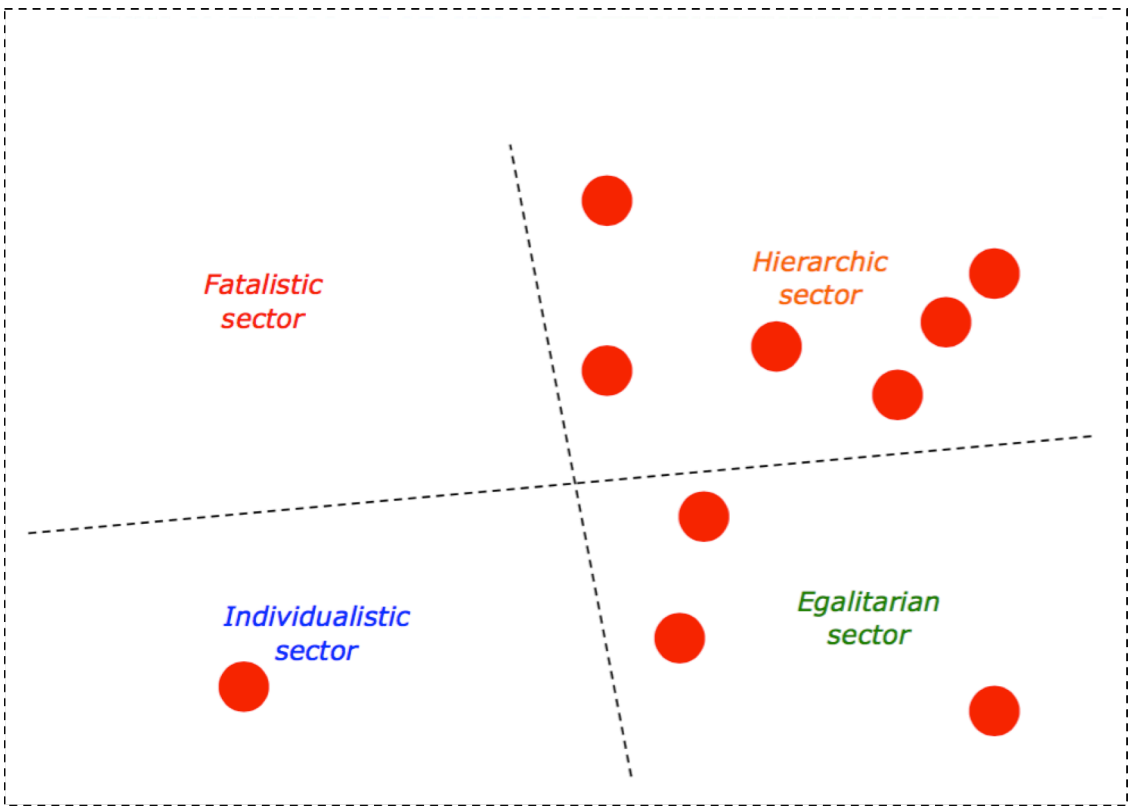

Figure 3.3. Data collection framework beneath the word cloud

the keywords name characteristic attributes (e.g. world view, rationality, approximation, structuring institutions, instruments, core solutions) of the four rationalities (figure 3.3). This set of keywords is derived from the book *Divided we stand: Redefining politics, technology and social choice* (1990) by Schwarz & Thompson, because a large share of the concept is fully based on that framework. It is assumed that the keywords based on the content of this publication, are valid representatives of the perceptions and perspectives that form the rationalities. Hidden underneath the word cloud design there is the Cultural Theory framework (figure 2.1), in a sense that the word cloud is grouped in such a manner they form the four sectors of this framework. Four sectors that represent the social attitudes known as: Hierarchism, Individualism, Egalitarianism and Fatalism (Schwarz & Thompson, 1990; Thompson et al, 1990; Douglas, 1999). The philosophy behind this specific exercise is that the social attitude of a certain actor in a certain rationality, manifests itself dominantly in one of the sectors by the choice of keywords. This should reveal itself than in the form of a point cloud of marks/red stickers in the specific sector (figure 3.3).

As the front side of the postcard survey serves the collection of data in order to perform the tests on hypotheses 1 to 3, the backside of the postcard survey should collect data needed for preforming the test on hypothesis 4 that demonstrates the Communication-phase of the conceptual model. This particular test should prove that *"Each archetype has certain sensitivity to particular incentives"*; preferences so to say.

2) Pre-defined incentives: With regard to the backside of postcard (figure 3.4) the aim of this second exercise of the survey is collecting data on preferences by a pre-defined palette of incentives. So the design is pretty straightforward; there is no deeper meaning beneath the design other than raw data collection. The design features twelve incentives from which – based on the Schwarz & Thompson (1990) literature – the first three are more attributed to a hierarchical social attitude, the second series of three incentives more attributed to an egalitarian attitude, the third series to a individualistic attitude, and finally the fourth series of three to a fatalistic attitude. Note tat the ecological validity of such a pallet can be discussed, however the data extracted by this experiment serves mainly the aim of making distinctions in preferences; to distillate applicable incentives for serving a true planning process is clearly not the aim of this experiment. In that sense the pallet is formulated in such a way it a) *Features incentives that meets the desires of the four theoretically defined social attitudes*, and b) *It depicts a contrast of preferences to the extent of incentives*. The formulation is done against the background of the Schwarz & Thompson (1990) literature.

The whole exercise can be performed within 2 to 3 minutes. Compared to a questionnaire survey of about

Figure 3.3. Survey design to extract on incentives

sixty questions, of which may be expected that an average interviewee will complete it in 30 minutes, this postcard method can be completed in a fraction of the time, and will be a minimal burden on the interviewees. By applying this specific method it is expected that participating in the experiment will become more attractive and therefore will increase the response rate significantly.

3.4 Indicators

Object-related and behavioral data is easily to measure, because it can be obtained relatively unambiguous. After all the data to obtain here regards countable and established facts, such as land-use/zoning, or countable preferences. However, in case of a subject related data stream, it comes to socially based information. In other words, the data is obtained from individual insights and can thus vary from subject to subject. Or shortly, the data steam is not cast in concrete and therefore not directly quantifiable. In an attempt to capture the subject related data steam into a reasonable direct way, indicating-concepts will be applied. This exercise should enable the experiment to capture social data into figures, which makes it possible to measure rationality amongst the tested population. An indicator in the sense of this experiment is a keyword that has been devised (or already exists as representative connotation) to one of the types of rationalities by Cultural Theory. Thus the indicators for rationality in this experiment are seen as an indirect figure of a concept, e.g. the size of satisfaction used in a customer survey.

To the extent of indicators a distinction between direct- and indirect indicators of concepts should be made. Because indicators may be directly or indirectly in their relation to the concepts for which they stand. To be more precise; an indicator literally described by literature such as preferred instruments and preferred solutions, have a much more direct comparison and a material status to the concepts of the various rationality types than an indirect indicators like an actors world view, rationality feature, approximation and structuring institution. Based on literature by Schwarz & Thompson (1990) the indirect indicators should relate to the rationality of specific actors who can be characterized as a certain type. Thus rationality type and rather needs to be measured on a battery of indirect indicators. Or better said as a bunch of multiple forms of behavior and insights. The choice of incorporating indirect indicators is mainly based on the idea of giving the theoretical basis of this research project more body. Just testing on the preferred instruments and preferred solutions would be to straight forward for the complex matter of social science. Thus, the results of the experiment have to show the extent to which this theoretical framework is a reflection of the real world. Indirect indicators are therefore a substantial part of the measurement, although the operationalization of these kind of indicators is a dicey exercise (to the extent of ecological validity and measure validity), they cannot be ignored because they give the strength of this reflection of theory to the real world, and there fore of value for the aimed scientifically conclusions.

3.4.1 Direct indicating keywords

The direct indicators are linked to perceptions because in this paper these are defined according to the *Oxford Advanced Learners Dictionary* (2010), as *"… an idea, a belief or an image you have as a result of how you see or understand"* (p.1126). Or *"…the various ways in which people understand a phenomenon,…"* (Verweij et al, 2006, p.1). Applied to this research that comprises the idea, belief or image a certain actor has on instruments and solutions with regard to river management measures. So the survey contains keywords that, according to theory, are inherently attributable to a particular rationality type of actor. Reasoning from the theoretical legacy of Cultural Theory these keywords should undeniably belong to the perceptions of one of the four specific actor rationality types. Should, because of the matter of measure validity. However, on behalf of the experiment, consultation of Cultural Theoretical literature is taken for substantial backup to assume this validity. That assumption is of course prone for discussion. Content wise the following publication texts led to the direct indicating keywords of the survey:

From a hierarchic perception the environmental circumstances – within a defined spatial area – would be stable but can be pushed over a (acute)limit where after circumstances will diminish. Translated to a spatial environment of river management development this would imply that the environmental consequences of measures will be irreversibly if the operation exceeds these limits (Thompson et al., 1990, pp.25-29). To prevent the environmental circumstances from being pushed over expert knowledge must be applied to determine the environmental limits and counter dangers (Thompson et al., 1990, p.88). *"A rational way of doing this is to set up rules and regulations"* (Hartmann, 2012, p. 248). To the extent of dimensions of sociality, hierarchists are characterized by advocating a high degree of collective control (Thompson et al., 1990, p.8; Douglas, 2007, pp.2-3). In this experiment collective control is interpreted as plans that are intended to achieve a particular purpose; strategies to prevent environmental hazard so to say. The desired system properties for solutions (measures) in the hierarchic actor's perception are based on controllability through inherent orderliness (Schwarz & Thompson, 1990, p.66). With regard to river management issues the latter can be formulated as a desire for safety programs. This led to a set of direct indicators as presented in table 3.2.
Reasoning from an egalitarian perception *"…the world is a terrifying unforgiving place,… and the least jolt may trigger its complete collapse…"* (Thompson et al., 1990, p.26). So from the egalitarian understanding, environmental circumstances are fragile. Following such believe the spatial environment of a river management planning area will react to any intervention what so ever, and in an undoubtedly irreversible way. So preservation – as in, making sure that (natural)values are kept – is the method to deal with such fragility. Translated into measures Nature conservation is seen as the best answer to the danger of irreparable environmental damage. Regarding any proposed measure the egalitarian actor will advocate mitigation in order to reduce the environmental consequences. Another important egalitarian point of view is that: *"…moral responsibility are reasons for taking action..."* (Hartmann, 2012, p.247). Thus choice of applying a specific instrument in order to achieve river management development will be based on a social-spirited mindset. The set of direct indicators that represent the egalitarian perceptions are shown in the above-presented table 3.2.

The individualistic perception on environmental circumstances of that same spatial area is resilient (Thompson et al., 1990, p.26). Within this individualistic

view the spatial environment may react to an intervention, but will never result in irreparable environmental damage (Thompson et al., 1990, p.29). Translated to the river management planning process: development is essentially a process of trial and error (Schwarz & Thompson, 1990, p.66; Thompson et al., 1990, p.29). A mindset that is legitimized by the fact that otherwise: *"…there would be no possibility of everyone becoming better off…"*; progress so to say (Thompson et al., 1990, p.29). In a certain sense such a stance can be related with an entrepreneurial bias of reasoning, as entrepreneurship is about taking risk (OUP, 2005, p.510). *"Those entrepreneurs whose world rests on an expansive vision of a future with rich opportunities are not going to agree that nature is inherently fragile..."* (Douglas, 1999, p.415). For the individualistic actor the spatial environment is seen as a *"…skill-controlled cornucopia…"* (Thompson et al., 1990, p.28). Thus these actors will advocate technical solutions in order to improve the spatial area. These perceptions lead to the set of direct indicators presented in table 3.2.

To the extent of the fatalistic perception, the environmental circumstances within a spatial area are not subjected to the sphere of influence of the (fatalistic) actor. This implicates that from a fatalistic understanding river management measures are inherently ineffectual, because the spatial environment is too capricious to respond to environmental hazards – like flooding – in advance (Thompson et al., 1990, p.28). In their believe these events occur like a lottery, thus one has to undergo these events rather than implementing useless measures (Schwarz & Thompson, 1990, pp. 66-67). Further more this archetype of actors finds themselves squeezed out from all institutional forms, to that extent they will feel themselves unheard, locked out and treated unfair (Thompson et al., 1990, p.28).

3.4.2 Indirect indicating keywords

The indirect indicating keywords have less direct comparison and a material status to the concept then the just elaborated direct indicating keywords. In that sense the indirect indicating keywords are more based on the storyline of Schwarz & Thompson (1990), instead of directly stemming from quotes out of peered publications. This implicates that: 1) *Indirect indicating keywords are vulnerable to subjectivity*, and 2) *Raises the issue on how to devise an indicator on something abstracts*, like worldview in a correct manner?

1) Considering subjectivity, one can place critical question marks wetter a keyword is capable to measure a concept in a correct way (face validity). Because of the possibility of a differences in connotation between the researcher and the interviewee. In order to overcome this risk all the indirect keywords are evaluated on the basis of their description in the *Oxford Advanced Learner Dictionary* (2005 edition; 2010 edition). It is assumed this institute describes the keywords in their most general sense;
2) With regard to the issue of abstract concepts, indirect indicators will mostly be based on: common understanding of a specific concept, or on anecdotal/qualitative evidence relating to that concept.

The indirect indicators in this research project will be, worldview, rationality feature, approximation and structuring institution; they all relate to the actors perspectives. The Oxford Advanced Learners Dictionary (2010) describes a perspective as *"... a particular attitude towards ..."* or *"... a way of thinking about ..."* (p.1132), thus in short, whit these indicators it comes on personal values. With the just mentioned considerations in mind the following indirect indicating keywords have been formulated:

Amongst this a hierarchic actor archetype there is a fear of losing control regarding environmental and spatial circumstances. With regard to development this implicates that these actors will fear the results of measures; the outcome of the planning process so to say. Concerning the process itself, a more bureaucratic attitude might be appreciated; *"Correct procedures and discriminated statuses are supported for own sake"*

Table 3.1. Direct indicators to give rise to perception

Archetype	**Item**	**Data features**	
		English	Dutch
Hierarchic actor	*Instrument*	*Expertise*	*Expertise*
	Instrument	*Rules*	*Regels*
	Instrument	*Strategy*	*Strategie*
	Approximation	*Control*	*Controle*
	Core of solutions	*Safety-programs*	*Veiligheidsprogramma's*
Egalitarian actor	*Instrument*	*Nature conservation*	*Natuurbeheer*
	Instrument	*Social-spirited*	*Sociaal-gezind*
	Approximation	*Support*	*(Onder)steunen*
	Core of solutions	*Preservation*	*Behoud*
	Core of solutions	*Mitigation*	*Mitigatie*
Individualistic actor	*Instrument*	*Progress*	*Progressie*
	Instrument	*Opportunity*	*Kansen*
	Instrument	*Commercial*	*Commercieel*
	Approximation	*Improvement*	*Vooruitgang*
	Core of solutions	*Technical solutions*	*Technische-oplossingen*
Fatalistic actor	*Instrument*	*Unfair*	*Oneerlijk*
	Instrument	*Locked out*	*Buitengesloten*
	Instrument	*Unheard*	*Niet gehoord*
	Approximation	*Uninformed*	*Ongeïnformeerd*
	Core of solutions	*Undergo*	*Ondergaan*

(*Source: Schwarz & Thompson, 1990; Thompson et al., 1990; Douglas, 2007; Hartmann, 2012)*

(Schwarz & Thompson, 1990, p.67). Cooperation might only be achieved if a well-founded plan is presented. Compensation must be found in equality and is based on expert-valuation. For this experiment these features are translated into the keywords: Risk, Strict & Discipline, Control & Caution and Authority. Risk to construe the worldview of *"…the possibility of something bad happening at some time in the future,…"* (OUP, 2005, p.1313). Strict and Discipline as a construe of the rationality feature that demands *"… a lot of control and rules…"* (p.1519), respectively *"…to obey rules and order…"* (p.433). Control and Caution as a translation of approximation. These two because Control stands for *"…the act for restricting, limiting or managing…"* (p.333), and Caution stands for *"… avoid danger or mistakes…"* (p.234). All together this should lead to a preference for Authority as the structuring institution, as these institutions will *"… have a particular area of responsibility in a country or region…"* (p.88), responsibility comes with *"… the duty to deal with or take care of…"* (p.1294). The hierarchic perspectives are recorded in table 3.3.

The perspectives of the egalitarian actor features a high degree of collective control, and it rather stands for social-equality. One could say that an egalitarian would care more for the result of a development than for the process towards it. From this point of view *"… equality, democracy and community are higher values than individual liberty..."* (Hartmann, 2012, p.247). So in that sense, development is – in the perspectives of an egalitarian – seen as a treat for the environmental condition. The egalitarian actor expects catastrophic and irreversible outcome of the planning process. So regarding the process, rejection and deflection might be expected, thus persuasion is the most appropriate approach. Cooperation might only be accepted if mitigation, compensation measures or environmental improvement is offered in return (Schwarz & Thompson, 1990, pp. 66-67). Keywords related to these features are formulated as: Fragility, Anxiety, Equality, Value, Support and Environment. Fragility to construe the idea of an environment that can be *"…easily destroyed or spoilt,…"* (OUP, 2005, p.615). Anxiety and Equality, as expressions of a rationality that has *"… a worry or fear about…"* (p.57) the spatial/environmental circumstances, and also features a pursuit for *"…being equal in rights, status advantages..."* (p.513). Value and Support as a translation of the egalitarian Approximation, because Value stands for *"…consider[ing] important…"* (p.1693), and Support stands for *"…sympathy and help…"* (p.1542). These together lead to a preference for the Environment as the structuring institution, as it is about *"…the physical conditions that exists…"* (p.511). The egalitarian perspectives are recorded in table 3.3.

With regard to the individualistic actor, their perspective emphasizes on (individual) self-sufficiency. Self-determination and individual liberty are thus important values in an individualistic perspective. *"For planning, individualism advises neoliberal schemes, but experimental approaches are also welcome"* (Hartmann, 2012, p.247). Regarding individualistic perception, development is permissible, but with an addition that individual freedom, self-determination and profitability, will never be compromised. Thus the individualistic actor has an opportunistic attitude towards outcomes of the planning process. Regarding the process itself, the laissez faire attitude might be the more appreciated approach. So only if there is an advantages to be gained, cooperation might be accepted (Schwarz & Thompson, 1990, p.67). The perspectives for this rationality type of actors are operationalized by the keywords: Unlimited, Liberty, Success & Commercial, Performance & Improvement, and Self-determination. Unlimited, for construing the individualistic actors worldview, because this specific keyword expresses on *"… as much or as many as is possible; not limited in any way,…"* (OUP, 2005, p.1676), Liberty, Success and Commercial for their Rationality feature as these keywords stand for *"… choose without too many restrictions from government or authority"* (OUP, 2010, pp.886-887), *"…achieve that u want…"* (p.1545), respectively *"… making or intend to make a profit..."* (p.298), and (High-)Performance and Improvement to express on Approximation. Performance to the extent of

Table 3.2. Indirect indicators to give rise to perspective

Archetype	**Item**	**Data features**	
		English	Dutch
Hierarchic actor	*Worldview*	*Risk*	*Risico*
	Rationality feature	*Strict*	*Strikt*
	Rationality feature	*Discipline*	*Discipline*
	Rationality feature	*Caution*	*Voorzichtigheid*
	Structuring institution	*Authority*	*Autoriteit*
Egalitarian actor	*Worldview*	*Fragility*	*Fragiliteit*
	Rationality feature	*Anxiety*	*Bezorgdheid*
	Rationality feature	*Equality*	*Gelijkheid*
	Rationality feature	*Value*	*Waarden*
	Structuring institution	*Environment*	*Omgeving*
Individualistic actor	*Worldview*	*Unlimited*	*Grenzeloos*
	Rationality feature	*Liberty*	*Vrijheid*
	Rationality feature	*Success*	*Succes*
	Rationality feature	*Performance*	*Presteren*
	Structuring institution	*Self-determination*	*Zelf-beschikking*
Fatalistic actor	*Worldview*	*Powerless*	*Machteloos*
	Rationality feature	*Distrustful*	*Achterdochtig*
	Rationality feature	*Uninterested*	*Ongeïnteresseerd*
	Rationality feature	*Unknown*	*Onbekend*
	Structuring institution	*Insignificant*	*Onbetekenend*

(*Source: Schwarz & Thompson, 1990; Thompson et al., 1990; Douglas, 2007; Hartmann, 2012)*

"very powerful" (p.1127), and Improvement as in *"… act of making things better; the process of becoming better"* (p.783). This actor archetype feature Self-determination as their actual structuring institute, as this kind of actor demands *"the right or ability […] to control their own fate"* (p.1387).

The last perspectives to elaborate on concerning the perspectives of the fatalistic actor, who are about disbelieve in both controllability and in justice. *"This rationality neglects planning …"* (Hartmann, 2012, p. 248). Regarding development, one may not expect any commitment. To that extent the fatalistic actor features an attitude of acceptance and absorption towards the outcome of a planning process. So concerning the process itself informing is rather important than persuading. The same holds for a land acquisition-procedure (Schwarz & Thompson, 1990, pp. 66-67). The following keywords will be used in this experiment in order to give rise to the just mentioned features: Powerless, Distrustful & Uninterested, Uninformed & Unknown, and Insignificantly. Powerless for construing the fatalistic actors worldview, as the keyword stands for *"… without power to control or to influence,…"* (OUP, 2005, p.1180), Distrustful and Careless are construes of the fatalistic rationality feature that is about the feeling that one *"… cannot trust or believe…"* (p.445), respectively the feeling that one does not care as a result of *"…not given enough attention..."* (p.224). Furthermore Uninformed and Unknown in order to express on Approximation. Where Uninformed is mend as the fact that within this group one feels suffering from *"… lack of knowledge or information…"* (p.1673), while Unknown stands for the fact that this group feels they are not *"… identified…"* by e.g. authorities (p.1675). This leads to Insignificantly as the actually structuring institute, because the fatalistic actor feels to be *"…not big or valuable enough to be considered important…"* (p.803)

3.5 Incentives

To test of the *"Prism"*-concept its Communication-phase, the survey also contains a pallet of pre-defined indicating incentives in order to extract behavioral data. This test stems from *hypothesis 4* that states: *"Each rationality type has a certain sensitivity to particular incentives"*. The core of the underlying idea behind formulating this specific hypothesis is in fact about testing the assumed *"lenses"* mentioned by John Forester (2004). These assumed lenses are in this experiment operationalized by the pallet of pre-defined indicating incentives that are tailor-made in order to fit the rationalities of Cultural Theory. Tailor-made in a sense that these incentives are formulated based on the storyline of literature by Schwarz & Thompson (1990).

During the actual experiment the term incentive will be replaced by the quote: *"What is important for you?"* This is done in order to make the term more accessible for a wider public. This exercise is defended by the fact that the meaning of the term incentive in this research project is mend as described in the Oxford Advanced Learners Dictionary (2005); *"Something that encourages someone to do something"* (OUP, 2005, p.784). Which basically has the same meaning but in for public more accessible terms. Another for this test very important thing to keep in mind is that all the incentives are mend as conditions under which actors are more willing to cooperate with the river management or WDF-measures, so for that reason the evident option of financial compensation is left out as an option to choose from. Considering that, the following indicating incentives have been formulated based:

As the hierarchic actor archetype fears the implementation of a measure will result in losing control over that spatial area, it is expected that cooperation for the implementing of such a measure might only be accepted if a well-founded plan – based on robust and well maintained measures – is presented. Because in the vision of a hierarchists, robust measures which will provide protection; even during extreme conditions. Technical solutions that are based on proven concepts are seen as the way to counter act the risk of losing control, so it is also expected that guaranteeing a robust technical design of measures might gain a higher chance on cooperation with a hierarchic actor. Further more a hierarchist beliefs the most in controllability through inherent orderliness, so an accurate security and management plan – which involves guaranteed and good maintenance – is also believed to be an incentive to gain cooperation of a hierarchic actor. Thus the incentives for hierarchic actor are being formulated as: 1) *Proper implementation*, 2) *Robust design*, and 3) *Guaranteed and good maintenance*. The hierarchic incentives are presented in table 3.4 (Schwarz & Thompson, 1990, pp.66-67; Thompson et al., 1990, p.28).

The egalitarian actor is convinced that the implementation of any measures what so ever, will result into a negative effect on the environmental circumstances of the spatial area, so in that sense it is expected that mitigation is the core incentive in order to gain cooperation of such an archetype of actor. Mitigation in order to make the impact of the measure less harmful for the environmental circumstances of that spatial area, because the implementation of these measures can have an impact on the natural values of that area, or result in the lost of cultural heritage. It is believed that also incentives like compensation of lost values and a sustainable redesign of the area may convince the egalitarian actor to cooperate with the implementation of river management measures. Thus it is assumed that as soon as conditions like, prevention in order to make sure that environmental values are kept in the best possible way, recovery if lost of values are unavoidable, or contribution to the area by a sustainable redesign of the landscape, will be offered to an egalitarian archetype of actor, the chance of cooperation will increase (Schwarz & Thompson, 1990, pp.66-67; Thompson et al., 1990, p.26; Hartmann, 2012, p.247). This resulted into the formulation of the following incentives for the egalitarian type of actor: 1) *Preventing damage to the environment*, 2) *Recover the loss of existing natural/cultural heritage* (loss as a result of the implementation of a measure), and 3) *Contribution to improving the environment/neighborhood*. The just elaborated egalitarian incentives are presented in table 3.4.

As the individualistic actor has an entrepreneurial bias of reasoning it is assumed that his archetype will reason from an opportunistic point of view. It is expected that an incentive like a permit for business expander fits in well with the commercial spirit of this archetype; a spirit which stands for economic growth. For example offering a permit for building a mega cow house to a dairy farm owner. By offering for such a specific permit in return for cooperating in river management measures, the willingness to sell (commercial) agricultural land may rise. Commercial

land, which is needed for the establishment of e.g. a flood prevention measure, like an inundation field. The same holds for the incentive rights on exploitation of the measure. One may also expect an entrepreneurial mind to finds commercial opportunities for exploitation of the measure. The eagerness to cooperate may increase soon as the rights for such exploitation will be offered. In this context one should think e.g. of the right to explore a catering establishment along the banks of a river catchment. Further more to the extent of the desire to progression land readjustment is also expected to be an incentive for gaining cooperation from this archetype of actor (Schwarz & Thompson, 1990, pp.66-67; Douglas, 1999, p.415; Hartmann, 2012, p.247). Thus incentives in order to gain cooperation of this archetype are being formulated the in following way: 1) *Permits* (e.g. for business expansion or economic activities), 2) *Rights on exploitation of the measure*, and 3) *Land readjustment*. The incentives for the individualistic archetype of actor are presented in table 3.4.

From the point of view of the fatalistic perception, the environmental circumstances of a spatial area are not in their sphere of influence. This archetype of actors are featured by disbelieve in controllability and in justice. So it is expected that both the incentives, involving the public in planning, and informing these actors with respect to the choices made, will increase their willingness to cooperate with the implementation of measures. Regarding river management one might not expect any commitment, so to the extent of the accompanied land acquisition-procedure it is expected that support with the redevelopment of property, as an incentive, will help to gain cooperation of this archetype (Schwarz & Thompson, 1990, pp. 66-67; Hartmann, 2012, p.248). Incentives for the fatalistic actor are formulated as: 1) *Being involved in planning*, 2) *Being informed* (e.g. about the choices made), and 3) *Help with the refurbishment* (e.g. of a garden or premises). Also the fatalistic incentives are presented in table 3.4.

3.6 Conclusion

This paper is the second in line of the three papers who should all together report the research project on *"How to stage cooperation for implementing river management-measures"*. As the overall research problem of the research project underlying this paper is lack of cooperation with the implementation of public

Table 3.3. Palette of contrasting incentives

Archetype	**Data features**	
	Rationale	Incentive
Hierarchic actor	*Reflecting on: Risk and Safety-programs.*	
		English: Robust measures (for protection in extreme conditions);
		Dutch: Degelijke maatregelen (voor bescherming bij extreme omstandigheden).
	Reflecting on: Caution, Control and Expertise.	
		English: Technical solutions (based on proven concepts);
		Dutch: Technische oplossingen gebaseerd op beproefde concepten.
	Reflecting on: Rules, Strategy, Strict, Discipline and Authority.	
		English: An accurate security and management plan;
		Dutch: Een accuraat veligheids- en beheersplan.
Egalitarian actor	*Reflecting on: Fragility, and Nature conservation*	
		English: Impact- or flood mitigation;
		Dutch: Mitigerende maatregelen.
	Reflecting on: Value, Environment, and Preservation.	
		English: Compensation of lost values (e.g. nature or cultural heritage);
		Dutch: Compensatie van verlies van waarde (bijv. Natuur of cultureel erfgoed).
	Reflecting on: Care, Social-spirited, Support and Equality.	
		English: Sustainable redesign of the area (e.g. improvement);
		Dutch: Zorgvuldige herinrichting (bijv. Verbeteren bestaande omstandigheden).
Individualistic actor	*Reflecting on: Progress, Opportunity, and Improvement.*	
		English: Permits (e.g. for business expansion or economic activities);
		Dutch: Vergunningen (bijv. voor bedrijfsuitbreiding of economische activiteiten).
	Reflecting on: Commercial, liberty, Unlimited and Opportunity.	
		English: Rights on exploitation of the measure;
		Dutch: Recht op exploitatie van de maatregel.
	Reflecting on: Rules, Strategy, Strict, Discipline and Authority.	
		English: Land readjustment;
		Dutch: Grondruil.
Fatalistic actor	*Reflecting on: Powerless, Unheard, and Locked-out*	
		English: Involving the public in the planning;
		Dutch: Betrekken van het publiek bij de planning.
	Reflecting on: Distrustful, Unknown, and Uninformed.	
		English: Information with respect to the choices made;
		Dutch: Informeren(communicatie) met betrekking tot de gemaakte keuzen.
	Reflecting on: Unfair and Undergo.	
		English: Support with redevelopment;
		Dutch: Ondersteuning bij herinrichting.

(Source: Schwarz & Thompson, 1990)

works development – with a focus on the river management and WFD-projects – in this research project it is stated a deliberated communication approach could increase the chance on cooperation. The comprehensive statements of this research project are: *"The mechanisms of Cultural theory have a great impact on the effectiveness of river management planning process, and appropriate communication can contribute to increase the effectiveness of such planning."* To convert these two bold statements into a properly established claim, the intention of the whole project is to prove them, based on figures. With the aim to do that, a conceptual-model, that is able to contribute to the understanding, the analysis and reacting on the just mentioned research problem has been developed. If one takes a glance at the research question of: *"What method gives substance to theory, and How to encapsulate the concepts"*, which underlays this specific paper, the question can in fact be divided as a composition of two separate questions. Firstly a question that seeks answers to *"What"* can theoretically depict the research problem, and the secondly a question on *"How"* to respond.

Answering on the first part of the question is done in this paper in a quick and dirty way by elaborating both the mechanisms of Cultural Theory, and the *"lenses"*-concept who together resulted into the *"Prism"*-concept. Note that content wise this first part of the question has a more theoretical base that harks back to the previous phase of this research project. Namely the theoretical-phase of the deductive research strategy this project follows. In that sense this paper has been quite shallow regarding the content and explanation of both Cultural Theory and the *"Prism"*-concept. The second part of the research question is actually more focused on the stage of research this paper aims to elaborate on, namely to experimentalize the conceptual model by setting up hypotheses and developing a method to test them. Thus the primary aim of this specific phase is to establish an experiment that is able to test the *"Prism"*-concept.

The actual experimentilization of the concept is built around the three different phases the model feature, and is an exercise to underpin the theoretical claims of these three phases. It comprises two tests for demonstrating the working of the mechanisms of Cultural Theory and one test in order to prove the concept of lenses. These first two tests should confirm the influence of Cultural Theory in the actual planning process by: 1) *Proving one can classify actors into archetypes*, and 2) *These archetypes share a certain Worldview and Cultural bias based on their perceptions and perspectives*. The third test is expected to give an answer to the second part of the research question. As this specific test tries to prove that applying the concept of lenses will increase the preparedness to cooperate with the implementation of water management measures.

3.6.1 Next phase

In the most general sense it can be said that this research project claims that perceptions and perspectives can be linked to specific rationality types of actors who in their turn can be linked to a specific land-use, and that these perceptions and perspectives can be used to trigger these actors. In this chapter/paper the experiment that is expected to prove these claims have been explained. The next phase of the research project will be to perform and evaluate the actual experiment. Or better said the actual testing of the set hypothesis followed by the analysis of the data as a result of this test. The elaboration of that analysis, including the discussion afterwards, will be the scope of the final chapter/paper of the research project, and follows after this one.

Notes

1 International Commission for the Protection of the Rhine (ICPR): In 1998 the ICPR identified 13 retention areas to be implemented before 2020. Until to date only 3 of them are realized (appendix A);
2 Initiation of the project: The research project is funded by the German non governmental organization *Hochwasser Competenz Centrum* (HKC) and aims to support the *Emsher Genossenshaft und Lippe Verband* (EGLV) and the *Wupperverband* with implementing river management measures;
3 Measure validity: The extent to which a measurement is well-founded and corresponds accurately to the real world (Bryman, 2012, pp.47-48);
4 Legal water tasks: e.g. assignments initiated from the *Flood Management Directive 2007/60/EC* or the *Water Framework Directive 2000/60/EC*;
5 Exploratory research: This research project is initiated from the Projectsteckbrief, *Akzeptantz für Auenlandschaften als Retentionsräume, Metthoden zum geselschafttliche Diskurs & zur Partizipation* (2015), issued by the HKC. The *Projectsteckbrief* demands amongst other things a *"…, preliminary study based on an experiment by a student Master wherein the method is used in the management of the Lippeverband,…"* (appendix A, p.2).

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Ch.4 The Analysis Discussing Cultural Theory: *A Shout Out for Sustainable Governance and Integral Area Development*

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Abstract Public work development can be notorious to the extent of both budget- and time overruns (e.g. Flyvbjerg et al., 2005). A clear reason for the existence of time overruns stems from opposition due to too much focus on the public measure itself and not so much focus on the spatial area (e.g. Priemus, 2007, p.626). In this research project, the stance is taken that a narrow way of thinking during the acquisition of the developing area can be seen as such a lack of focus. Planning problems arise here because in many cases public work development is projected on private property, and in most western countries it is accustomed to implement such measures based on voluntary cooperation. In order to gain such cooperation initiating parties apply acquisition strategies. However these strategies frequently ignore the fact that the social world is subject to plurality. This negligence has in many cases resulted into fierce opposition, which had repercussions on time estimates and thus undermined the *effectiveness* of the planning process. This research project examines whether such planning issues due to Pluralism can be tackled. For this purpose a concept has been developed, that: 1) *Unravels plurality into rationalities, 2) Appoints characteristics to these rationalities*, and then 3) *Reflects on these characteristics*, to reduce *lack of cooperation*. In order to demonstrate the concept an experimental set up has been preformed with purpose to test its capability. The test results and analysis of these results will be discussed in this paper.

Keywords
Cultural Theory, Experiment, Incentives, Kromme Rijn, Perspectives, Perceptions, Plurality, Rationality, Strategies.

4.1 Introduction

The initiation for this research project can be originated from the ARD *Brennkpunkt*[1] broadcasted on June 11th, 2013. On which the urging need for high-water retention areas was mentioned. In this particular broadcast the ARD emphasized on a view important lessons learned from the flooding events during this particular year (2013), summarized:

1) *"Es müssen mehr Flächen für Hochwasserretention – auch extremer Hochwasser – bereitgestellt warden"*;
2) *"Das Kompetenzwirrwarr der Behörden im Hochwasserschutz verursacht sehr lange Verfahrensdauern von Projekten"*;
3) *"Bürgerinitiativen (und Umweltschutz) blockieren häufig Hochwassermaßnahmen"*.

Especially the last enumerated lessons have been of great importance to the actual initiation of this research project. Namely: *Current (civil) usage (and environmental effects) often blocks the realization of such river management measures*. To illustrate, the International Commission for the Protection of the Rhine (ICPR), already identified in 1998 the need of thirteen retention areas, which had to be realized before 2020. At the initiation of this project (2016) just three of them are implemented (appendix A). Considering the aforementioned, an important question, that can be raised, would be "*How to stage cooperation for implementing River Management Development?*"

One clear problem can be found in a defensive posture of landholders. In generally the necessity of retention is well accepted, and supported. But there will be always something like a public interest contradicting a self-interest – a *"Not in my backyard"*-attitude (NYMBY) – *which* utterly may result into opposition. Such an opposition can make the realization of river management development complex and long lasting processes. To conclude, this defensive posture can even become an obstacle to meet assignments like the just mentioned water task formulated by the ICPR or the *"Room for the River"*-program[2] of the Dutch Central Government

4.1.1 Cooperation

In general *land readjustment* and *compensation* are the most deployed instruments in order to gain the needed cooperation for implementing river management measures. Nevertheless experience wise (appendix A) these kinds of instruments do not necessarily guarantee willingness to cooperate. Of course one may expect the effectiveness of the instrument to increase as soon as it becomes lucrative for the landowner to cooperate. But yet within the scope of this research project, the stance is taken that profit may never be the incentive to gain cooperation. To conclude; land exchange and compensation, may not necessarily be the only key to realization of river management measures. So given the difficulties to stage cooperation from the landowners one may consider whether the tools to arrive at this cooperation are the most effective or not? One of the

gaps within the planning process of river management measures might be the fact that participation – as in civil involvement in order to convince and gain trust – is not yet fully exploited. An important element of this research was to investigate, to what extent such civil involvement can be a fruitful addition to the current planning process of river management measures. The assumption then was that civil involvement enables the process to hook on to different perceptions and perspectives of participants and landowners who are during this project named *"actors"*.

Regarding perceptions and perspectives one should think for instance perceptions on flooding problems, and perspectives on *how* to implement certain measures in a correct way; which is highly subjective. The aim of this project was basically to find *"a new way of communication with civil participants and landowners in order to gain cooperation for implementing river management measures"*, and then to use this knowledge for developing a proper instrumentation. However, before further elaboration, first some background information and insights to the causes of the aforementioned problem that utterly led to the making of this particular research.

4.1.2 Project initiation

Under the conditions described in the previous paragraph, the question arises as to what options are available to achieve these river management projects. So far, it is clear that the present planning process has a certain need for modification. Additions and modifications include: *"new land policy instruments*, *as in a modern style of coordination by the authorities"* – in particular in need of a good participation – and ultimately the initiation of a *social debate on the need for the measure itself* (appendix A). Solutions regarding the blockage of river management projects can be amongst others sought in the just mentioned additions and modifications to the current planning process. One of the conditions for this research project laid down by the HKC, is that actors will be integrated into the planning process. This new group of participants in planning comprises amongst others: 1) *Landowners*, 2) *The local economy* and 3) *The agricultural sector* (appendix A). That demand was the exact reasoning for developing the *"Prism"*-concept. The actual research project includes a test of the theoretical concept in practice. This concept is based on a theoretical approach (Cultural Theory) in where four archetypes of participating stakeholders are defined. These four archetypes stand model for the different motives of citizens who engage in a public planning process. The philosophy behind the set up is to create a sustainable integration strategy that is able to respond to the motives of these four archetypes, by reacting with appropriate incentives that fit the different rationalities (to the extent of perceptions and perspectives). In the project, this theoretical concept is used in the planning process for the development of nature-friendly shorelines (a water task that arises from the WFD-directive by the EU) by developing appropriate incentives that will be tested in practice. In this project the test in practice is also known as the experiment.

The results of this project gives input for a *guideline for river management development* which helps integrating sectorial policy perspectives regarding e.g. *flood protection* or *nature conservation* with an other important aspect, namely social needs of a planning area (appendix A). The application of the umbrella project, from which this project is only a partial project, includes amongst others:

1) A preliminary study based on an experiment by a Master-student (MSc. Urban and Regional Development) in which the concept is developed and the method is applied in the management of the water board *Hoogheemraadschap Stichtse Rijlanden* (HDSR);
2) Participation in a scientific conference to discuss the concept and the dissemination of ideas in an international context;
3) Raising funds for the actual scientific research into the development of methods of cooperation between *Emschergenossenschaft und Lippeverband* (EGLV), *Utrecht University* and *HKC*.

This project implements the first step of the overall project (appendix A).

4.1.3 Theoretical framework

The backbone of the theoretical framework of this project origin from the book *Divided We Stand: Redefining Politics, Technology and Social Choice* (1990) by *Michiel Schwarz* and *Michael Thompson*. By writing this book these two authors set the foundation of the theoretical concept that in this project is referred as *Cultural Theory*. The concept is in fact a framework that gives a theoretical explanation for social conflicts that may arise during a planning process of public works, because it distinguishes and considers different rationalities of actors within such a planning process. In this project the framework was deployed to analyze the *perceptional and perspective contradictions*, because it is capable to unravel such plurality that causes the planning issues who come with the implementation of *river management* measures.

4.1.4 Concept

Essentially the concept developed during this research project was meant to break down a barrier in the actual project management process for the implementation of a river management measure; the lack of cooperation by the involved actors. In order to actually implement a river management measure the initiators have to start a project management process, e.g. the *Integrated Management System* (IMS). Ideally such a process flows along a straight path trough a planning-phase, a preparation-phase into the implementation-phase. During the preparation-phase a *land acquisition* process will be started in order to obtain the needed space for the actual realization of the intended measures. In many cases of public work development this *land acquisition* process incorporates traditional *strategies* based on just two conservative standard incentives, namely *land readjustment* and *compensation*. However to the social reality of the actual built environment far from conservative; it is rather plural. So to the extent of actors (and stakeholders) these two incentives are not always sufficient, because these do not fit the actor's *perceptions* and *perspectives* in a proper way, and thus will not encourage the actor to cooperate. Such unwillingness to *cooperate* with the *land acquisition* procedure utterly results in stagnation in the planning process. In a more abstract way one can say the clean flow of the project management process does not corresponds with the social reality of the build environment, because the instruments do not fit all the

prevailing *perceptions* and *perspectives* of the actors. These include *perceptions* on environmental circumstances within such a defined spatial area and *perspectives* on how their spatial environment should be treated. The purpose of the conceptual model is to eliminate the stagnation and restore the flow of the process. The model tries to obtain that aim by incorporating three sub-phases into the process.

The conceptual model which schematizes the theoretical ideas behind this research project links the previously mentioned rationalities to cooperation trough the use of communication. These three aspects serve in the model as phases in a land acquisition process. Land acquisition for the sake of the implementation of the needed river management measures.

Lack of cooperation for river management measure regards the actual research-problem, and the aspect communication refers to the research aim of testing the effectiveness of strategies by incentives that meets the actor's perception and perspectives. So to say the concept demonstrates the assumption that appropriate communication should be able to bend opposition – due to differing perceptions and perspectives on river management measures (planning object) and the planning process – towards cooperation. The concept (figure 2.4), visualizes how a divergent flow in the planning process, due to differing perceptions and perspectives (plurality), will be transferred into a convergent flow due to the use of appropriate communication strategies that fit these perceptions and perspectives.

4.1.5 Experiment

To resume, it is expected that the just elaborated concept can contribute to increase this effectiveness of the implementation process of public work development. However before this is bold expectation can become a valid claim, it that must be properly established on the basis of figures. The intention of this project was to prove so by experimentally testing the concept in an actual river management-developing environment. Initially three catchment areas had been selected to preform the experiment, namely the area's of the *Wupper* and *Lippe* in *North Rhine-Westphalia* (Germany) and the *Kromme Rijn* area in the Netherlands, because all the three rivers are subject to water tasks from EU-directives. However due to the German *Federal Data Protection Act* (1990), which prohibits institutions to provide of personal data (BDSG, 1990; EC, 1995) it was not possible to obtain the for the experiment necessary information within any short terms. There for only the *"Kromme Rijn"*-experiment has been preformed.

As this last phase of the research covers the analysis of the projects experimental, the question that should support this search is formulated the following:

> "*To what extent is the concept capable to improve the effectiveness of the planning process of river management development?*"

To arrive at an answer on that question requires an analysis on survey results of the experiment. The question it self refers to Cultural Theory because it is this framework that serves as the most important component of the concept. In a certain sense Cultural Theory is not only the overarching framework along which the distribution into rationalities is arranged, it also serves as input for formulating the incentives who play a key role in gaining cooperation. The decision to take this particular question as a starting point for this phase comes from the need to put the concept to trail. Demonstrating the concept has a positive effect on the willingness to cooperate means improving the effectiveness of its planning process.

4.2 Research project

As the research project was established based on a deductive strategy, the research process followed a five-phase approach of: 1) Setting a theoretical framework, 2) The setting hypotheses, 3) Collecting data, 4) Analyzing this data in order to com to findings and finally 5) Confirmation or rejection of the initial claims. By developing the *"Prism"*-concept a theoretical framework has been set, so the next exercise in the project was to test the set of hypotheses.

The exact philosophy behind the formulation of these hypotheses was that, once demonstrated the phenomenon of pluralism in the build environment of a river management development area – the scope of hypothesis 1 – the unrevealed knowledge about the division of rationalities would be administrated to test the perceptions and perspectives that comes with these rationalities. The later then would be the scope of hypotheses 2 and 3. The last hypothesis (4) was formulated in order to test whether there exist such a thing as specific incentives that specifically belong to certain rationalities. If so this could be the key to gain cooperation for the implementation of measures, and is thus improve the effectiveness of a planning process. To the extent of the phases of the conceptual model, hypothesis 1 comprises the Rationalities-phase, while both hypotheses 2 and 3 are derived from the models Communication-phase, and hypothesis 4 should embody the Cooperation-phase.

4.2.1 Data collection

To give substance to the next phase of the research strategy – the collection of data – information (data) had to be drawn out of the research area, and merged into a data set. The information for the data set had to be distillated from the (potential) actor population. The demarcation of this actor population, who had to be approached for participating in the experiment, was based on a potential chance of becoming subjected to river management measures. The exact operationalization of this target population has been formulated in the prior phase like:

> *"Owners of land plots which lie in a range of 50 meters from the shoreline of the river Kromme Rijn"*

The entire data set was obtained by survey conducted in November until December 2016. The data was obtained by means of either: a) *Sent postcards*, or b) *Door-to-door surveys* on the basis of a form that featured the same design as the postcard. The total population of the owners in a width of 50m either side of the catchment of the river Kromme Rijn concerned 458 cases at the time the sample was drawn (September 17th, 2016). In order to obtain a valid set of data, a minimum response rate of 210[3] was needed. The final data set that was used for analysis (*DATASET Kromme Rijn 50m 31 december 2016*) contained, after a check on validity, a number of 218 cases who could serve as input (appendix D).

4.3 Findings

The experiment has been conducted in order to contribute to the understanding, the analyzing on the research problem. So, the core of the experiment was about experimetalizing the conceptual model by: 1) *Testing the claims of Cultural Theory*, and then, 2) *Testing a multi communication strategy approach*. The later by deploying the set of distinctively operationalized incentives that are tailor-made to the rationalities of the theoretical framework of Cultural Theory (chapter 3.5).

The first partial test was done in order to confirm hypothesis 1) and should give answers to the research sub-question: *"To what extent is it possible to generalize the residents of a certain catchment area to a standard set of archetypes?"* The next two partial tests concerned almost the same analysis method except that hypothesis 2 analyzed the perceptions of actors while hypothesis 3 analyzed the perspectives. Both test have been exercised in order to find answers to the research sub-question that came with these two hypotheses. These have been formulated as: *"Assumed that the population is to generalize archetypes, which perspectives goes with each archetype?",* for hypothesis 2). And fairly the same question for hypothesis 3) only for hypothesis 3) *"… perspectives…"* instead. The fourth and last partial test in order to prove hypothesis 4) was looking for an answer to the sub-question: *"To what extent do the assumed archetypes exhibiting preferences towards certain incentives?"* The philosophy behind the set of questions was that, once demonstrated the Cultural Theory by sub questions 1) to 3), the gained knowledge could be administrated to test a multi communication strategy approach of incentives that respond to the theoretical rationalities. Question 4) should give sufficient clues to initiate that test.

To arrive at answers to the just elaborated set of sub-questions the research design (figure 3.1) was build around four analyses that where expected to underpin the conceptual model. As the model was based on three phases, so did the research design, basically the research design followed the same path in where those phases have been merged. The Rationality-phase was tested by hypothesis 1), the Communication-phase by both hypotheses 2) and 3), and hypothesis 4) tested the Communication-phase.

4.3.1 Hypothesis 1

Testing hypothesis 1 was about the examination of a statistical correlation between the *type of owner* of property along the river *Kromme Rijn*, and the *type of rationality* represented by this owner regarding the implementation of nature friendly shorelines. The owner type referred to actors who are using their property in accordance with the legally established land-use for their property. Such legal establishment is better known under the term *"zoning"* (paragraph 3.2.2). The proviso here was that these owners have such property in a range of 50 meters from the shoreline of the river *Kromme Rijn* (paragraph 3.3.1; 4.2.1). The type of rationality was determined based on the basis of dominant preferences of such an actor in one of the four quadrants of the Cultural Theory framework (figure 2.1). Data with respect to this preference where distilled from the target population by the just mentioned survey. The whole exercise is done in order to demonstrate the research query: *"To what extent it is possible to generalize the residents of a certain catchment area to a standard set of archetypes*." The foundation of claims to the extent of this sub-question mainly stem from validation of survey results by a Chi-square test. The initial survey results have been merged into the frequency table 4.1.

Cross table 4.1 links all the land-uses occurring in the population to the four theoretical rationalities of Cultural Theory. The philosophy behind the confrontation is to expose patterns of dominant common combinations of land-use and rationalities. Such compositions are, in this study, referred to as archetypes. Although the result of this frequency table may seem to give some insights,

Table 4.1. Cross table; Zoning vs. rationalities

	Rationalities									
	Fatalistic		Hierarchic		Egalitarian		Individualistic		**Total**	
Land-use	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*
(based on zoning)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Dwelling	*28*	*15%*	*25*	*14%*	*97*	*53%*	*34*	*18%*	*184*	*100%*
Mixed use	*1*	*20%*	*0*	*-*	*2*	*40%*	*2*	*40%*	*5*	*100%*
Business	*1*	*20%*	*3*	*60%*	*0*	*-*	*1*	*20%*	*5*	*100%*
Traffic	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*	*1*	*100%*
Water	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*	*1*	*100%*
Recreation	*0*	*-*	*0*	*-*	*2*	*100%*	*0*	*-*	*2*	*100%*
Forrest	*0*	*-*	*1*	*100%*	*0*	*-*	*0*	*-*	*1*	*100%*
Nature	*1*	*100%*	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*
Agriculture	*8*	*57%*	*3*	*21%*	*1*	*7%*	*2*	*15%*	*14*	*100%*
Agriculture with Natural value	*1*	*25%*	*1*	*25%*	*2*	*50%*	*0*	*-*	*4*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Table 4.2. Cross table; Land-use vs. rationalities

	Rationalities									
	Fatalistic		Hierarchic		Egalitarian		Individualistic		**Total**	
Land-use (based on zoning)	Cases (N)	*Ratio* (%)	Cases (N)	*Ratio* (%)	Cases (N)	*Ratio* (%)	Cases (N)	*Ratio* (%)	Cases (N)	*Ratio* (%)
Residential use[1)]	*29*	*16%*	*25*	*14%*	*96*	*52%*	*34*	*19%*	*184*	*100%*
Non-residential use[2)]	*11*	*32%*	*8*	*24%*	*8*	*24%*	*7*	*21%*	*34*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

1) Includes all the plots within the dataset where a Dwelling use is granted by an institutional zoning plan;
2) Includes all the plots within the dataset which have a Agricultural, Agricultural with natural value, Mixed, Forrest, Water, Commercial, traffic, Nature or other Public use is granted by the current institutional zoning plan;

statistically it has no value. Due to the for a Chi-square test applying preconditions[4], it was necessary to bundle the zoning information into the more generic variable type of land-use. Compared to the original subdivision of table 4.1, only two archetypes remained. This exercise can be considered as a clear-cutting with regard to details of the research results, however the limited presence of zoning categories in the available dataset left no other choice, then the reduction into two archetypes. Nevertheless, these two categories are distinctive enough to show that there is a correlation between an archetype in land-use and rationality, which was initially the aim of the test. The merging exercise resulted in the less detailed frequency table 4.2.

The frequencies in this cross table (4.2) concerned the observed frequencies of dominance of choice to the extent of rationalities by the actors. The Chi-square test has been applied to statistically analyze those observed frequencies. Based on that test the claim drawn on partial test 1 was that there is a significant relationship, $X^2(3)=11,2$; $p<0,05$, between land-use and rationalities of land owners who have property along the catchment of the river *Kromme Rijn*.

On the basis of percentages in cross table 4.2 interpretations regarding the influence of the variable land-use on the variable actor rationality, have been made. Or better said, whether actors in one of the two archetypes of land use exhibit a greater representation in one of the quadrants of the Cultural Theory framework. Within the for this research project considered catchment area of the Kromme Rijn, the landowners of plots who feature a Public-/Commercial land-use seem to have a much higher percentage of representation in the category Fatalstic actors (32%) compared to the remaining categories. These all stay around the 20% (resp. Hierachic actors 24%, 24% and Egalitarian actor Individualistic factor 21%). In the land-use category of only Dwelling the is Egalitarians are clearly the most common rationality type (52%). The remaining 48% is almost equally divided amongst the to the rest of the categories (resp. Fatalistic actors 16%, 14% and Individualistic Hierachic actor 19%). To resume, cross table B.2 shows that landowners of property that features a Public-/Commercial land-use have a bigger representation in the Fatalist quadrant of the Cultural Theory framework. On the other hand, landowners with property with a Residential type of land-use, features more dominantly an Egalitarian rationality. The assessment of this partial test was conducted to demonstrate whether or not there is a statistical relation between the use of land-plots along the *Kromme Rijn* catchment and rationalities of the owners, and although not as detailed as intended, the observed patterns do provide a clue. A more heterogeneous population is expected to provide more distinctive results.

4.3.2 Hypothesis 2

The testing of hypothesis 2 was about exanimating: *"To what extent certain archetypes base their rationalities on perceptions, and which specific perception is typical for such an archetype*." A hypothesis that was formulated around the research question: *"Assumed that the population can be generalized to archetypes, which perception goes with each archetype?"* To get a global first picture on this statement a frequency table in which the by the actors chosen operationalized perceptions (paragraph 3.4.1) have been confronted to the in the first partial test composed two archetypes. This picture is shown in *table 4.5* presented below the next page.

Even though certain patterns can be recognized from this table (4.5), it does not sufficiently proved a relation between operationalized perceptions and archetypes of actors, because differences between these groups can be based on coincidence. This implicates that in order to get more certainty about found patterns an Analysis of Variance (ANOVA) had to be performed. After exercising the ANOVA-test the analysis revealed that *the degree of perception in total* with regard to both groups, *Fatalistic residential actors* (M=1,9; SD=1,7) and *Hierarchic residential actors* (M=3,7; SD=2,3), is significantly different. $F(1,5;7)=2,4$; $p=0,02$. There is a *Weak relation*; 7% of the variance on the *degree of perception* is explained by the *archetypes rationality* ($eta^2=0,074$). A Tukey test showed that within the groups of archetype Fatalistic residential actors and Hierarchic residential actors differed significantly to the extent of degree of perception in total ($p= 0,03$).

The core of this partial test (2) was a statistical analysis using descriptive statistics. The scores for the *degree of perception in general* versus the *rationalities* of *two archetypes* have been compared. This was done, amongst other things based on the arithmetic mean of the by survey chosen indicators who are related to perceptions (paragraph 3.4.1). The results of this analysis are presented in *table 4.3*. This table figures the following picture: Both archetypes, – *Residential* and *Non-residential* – contain the four rationalities, *Fatalistic*, Hierarchic, *Egalitarian* and *Individualistic*. So the actual

analysis compared the two archetypes based on their four rationalities. Within the residential category of archetype, the rationalities featured respectively the following means scores: Fatalistic residential actors (2), Hierarchic residential actors (4), Egalitarian residential actors (3) and Individualistic residential actors (2). The Non-residential category of archetype featured: Fatalistic non-residential actors (2), Hierarchic non-residential actors (3), Egalitarian non-residential actors (3) and the Individualistic non-residential actors (2).

Table 4.3. Perceptions; Mean of chosen indicators

Archetype	Mean
Fatalistic residential	*1,90*
Hierarchic residential	*3,72*
Egalitarian residential	*2,59*
Individualistic residential	*2,47*
Fatalistic non-residential	*2,09*
Hierarchic non-residential	*2,63*
Egalitarian non-residential	*2,75*
Individualistic non-residential	*2,43*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

The interpretation of this information has been done in the following way: In reach of the *Kromme Rijn* catchment the distribution of rationalities within the two archetypes is almost equal. In this distribution the rationality of the Hierarchical and the Egalitarian actors is, with the scores of 3 or more, to a higher extent based on perceptions than Fatalist or Individualistic actors. Who both have the lower mean of 2. For the catchment area of the river *Kromme Rijn* it can be concluded that the more group-oriented rationalities (Hierarchism and Egalitarians) base their worldviews and cultural biases for a larger share on how one sees or understands. Translated to the framework of Cultural Theory the analysis gives a view as presented in the figures 4.1a respectively 4.1b.

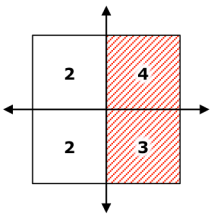

Figure 4.1a. Meanscores on the degree of perceptions in the category Residentials

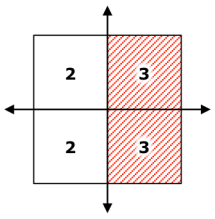

Figure 4.1b. Meanscores on the degree of perceptions in the category Non-Residentials

The range of scores for degree of perception that archetypes feature has also been analyzed. The outcome of this inquiry was that degree of perception varies greatly by the rationality with the proviso that within the reach of almost all rationalities – except for the Egalitarian non-residential actors – there are always cases whose rationality is not intellectually based on perceptions (table 4.4). The results of the survey indicates that the interquartile range (IQR) for the different rationalities by the archetype are as follows: Fatalistic residential actors (2) Hierarchic residential actors (4) Egalitarian residential actors (3) Individualistic residential actors (3), Fatalistic non-residential actors (2), Hierarchic non-residential actors (3), and non-residential Egalitarian actors (4) and non-residential Individualistic actors (4). That is, so to say that the range of the 50% median scores for the degree of perception on a scale of 0-10, for witch each group differs from each other (table 4.4). Strikingly the Fatatalistic actors of both the Residential and Non-residential archetype exhibit a higher concentration of scores around the median (2) than the other rationalities (3-4). It can be concluded that both Hierarchical-, Egalitarian- as Individual actors, in both archetypes are, as regards the structure of their rationality, more divided on the degree of perception relative to the Fatalist actors.

Table 4.4. Perceptions; Score range and interquartile range

Archetype	Score *min-max*	IQR
Fatalistic residential	*0-7*	*2*
Hierarchic residential	*0-8*	*4*
Egalitarian residential	*0-6*	*3*
Individualistic residential	*0-7*	*3*
Fatalistic non-residential	*0-6*	*2*
Hierarchic non-residential	*0-7*	*3*
Egalitarian non-residential	*1-6*	*4*
Individualistic non-residential	*0-6*	*4*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Regarding the part of the question "*…which specific perception is typical for an archetype"* the analysis has been done based on descriptive statistics on the found patterns in table 4.5. For the actor population along the *Kromme Rijn* catchment the following interpretations has been made: Fatalistic residential actors feel *locked out* and *uninformed* (respectively 21% and 41%), Hierarchic residential actors see *expertise* as the point of departure for applying *nature conservation* (resp. 52%, 52%) Egalitarian residential actors however see *preservation* (52%) as the method of *nature conservation* (52%), Individualistic residential actors see the implementation of measures as a *progress* (68%) that offers new *opportunities* (44%) for the area. To the extent of the Non-residential archetype, the Fatalistic non-residential actor feels above all *unheard* (73%), the Hierarchic non-residential actors have a idea that *rules* (50%) and *control* (38%) lead to appropriate *nature conservation* (38%), while Non-residential Egalitarian see nature conservation (86%) as some sort of *progress* (43%), the non-residential Individualistic actor hold the same view on *nature conservation* (71%) as *progress* (57%) applies to the non-residential Individualistic actor as well. Only this group also sees *opportunities* for such a development (43%). It is striking that across the board population the perception *nature conservation* by 62%, is the most selected perception. In that sense that it occurred almost twice as often in the entire population as in the following perceptions *preservation* (31%) and *technical solutions* (29%). This suggests that the operationalization of this indicator has been too generic. The ecological validity here is prone for discussion.

Table 4.5. Perceptions; Percentage (%) within the archetypes

Perceptions	% of pop.	Archetype: Residential F[1]-actor	Residential H[2]-actor	Residential E[3]-actor	Residential I[4]-actor	Non-residential use F[5]-actor	Non-residential use H[6]-actor	Non-residential use E[7]-actor	Non-residential use I[8]-actor
Expertise	*13%*	*-*	*52%*	*13%*	*3%*	*-*	*-*	*29%*	*14%*
Rules	*11%*	*7%*	*28%*	*6%*	*9%*	*-*	*50%*	*14%*	*14%*
Strategy	*11%*	*3%*	*36%*	*8%*	*6%*	*-*	*25%*	*14%*	*-*
Control	*10%*	*10%*	*36%*	*7%*	*-*	*-*	*38%*	*-*	*-*
Safety-programs	*9%*	*-*	*44%*	*5%*	*3%*	*-*	*13%*	*-*	*14%*
Nature conservation	*62%*	*21%*	*52%*	*89%*	*44%*	*27%*	*38%*	*86%*	*71%*
Social-spirited	*4%*	*-*	*4%*	*7%*	*3%*	*-*	*-*	*-*	*-*
Support	*7%*	*-*	*4%*	*12%*	*3%*	*-*	*-*	*14%*	*-*
Preservation	*31%*	*14%*	*24%*	*52%*	*15%*	*-*	*-*	*29%*	*-*
Prevention	*3%*	*-*	*8%*	*3%*	*-*	*9%*	*-*	*-*	*14%*
Progress	*27%*	*3%*	*20%*	*23%*	*68%*	*-*	*13%*	*43%*	*57%*
Opportunity	*17%*	*3%*	*20%*	*10%*	*44%*	*-*	*13%*	*14%*	*43%*
Commercial	*3%*	*3%*	*4%*	*1%*	*9%*	*-*	*-*	*-*	*-*
Improvement	*5%*	*-*	*4%*	*2%*	*18%*	*-*	*-*	*-*	*14%*
Technical solutions	*29%*	*7%*	*16%*	*10%*	*12%*	*9%*	*-*	*14%*	*29%*
Unfair	*5%*	*17%*	*4%*	*-*	*3%*	*27%*	*-*	*-*	*-*
Locked out	*5%*	*21%*	*4%*	*1%*	*-*	*27%*	*-*	*-*	*-*
Unheard	*7%*	*14%*	*-*	*1%*	*3%*	*73%*	*-*	*-*	*-*
Uninformed	*9%*	*41%*	*8%*	*2%*	*-*	*36%*	*-*	*-*	*-*
Undergo	*4%*	*13%*	*4%*	*3%*	*3%*	*-*	*-*	*-*	*-*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Archetypes of actors: 1) Fatalistic residential actor; 2) Hieratic residential actor; 3) Egalitarian residential actor; 4) Individualistic residential actor; 5) Fatalistic non-residential actor; 6) Hieratic non-residential actor; 7) Egalitarian non-residential actor, and 8) Individualistic non-residential actor.

4.3.3 Hypothesis 3

Testing of hypothesis 3 was about exanimating: *"To what extent certain archetypes base their rationalities on perspectives, and which specific perspective is typical for such an archetype"*. This test was, except for the type of indicators to a large extent the same exercise as the testing on hypothesis 2. The hypothesis that was formulated here was derived from the research question: *"Assumed that the population can be generalized to archetypes, which perspective goes with each archetype*?*"* Like the prior test a frequency table has been created. With that difference that during this test, instead of perceptions the operationalized perspectives (paragraph 3.4.2) have been confronted to the in test 1 composed archetypes. This exercise resulted into *table 4.8*. Like the test on hypothesis 2, prior to this test, also from this table (4.8) a certain patterns in relation between operationalized perspectives and archetypes of actors can be recognized. Yet, like the resembling prior test on hypothesis 2, in order to get more certainty about found patterns one have to perform an Analysis of Variance (ANOVA) for reasons who have been explained. This ANOVA test unfortunately revealed that *the degree of perspective in total* with regard to the archetype rationalities, was not significantly different. $F(7;210)=1,2$; $p=0,3$. Thus the in this partial test (3) drawn conclusions about found patterns, feature no certainty and needs to be discussed.

Likewise partial test 2 the core of the test was based on a statistical analysis using descriptive statistics. In this statistical examination, amongst other things, the arithmetic mean of the scores on *degree of perspective in general* versus the *rationalities* of *archetypes* have been analyzed. The results of this analysis are presented in *figure 4.6*. Both archetypes contain the four rationalities so the actual analysis compared these two archetypes based on their rationalities. The results of this analysis have been interpreted in the following way: Within the Residential category of archetype, the

Table 4.6. Perspectives; Mean of chosen indicators

Archetype	Mean
Fatalistic residential	*2,10*
Hierarchic residential	*1,68*
Egalitarian residential	*1,40*
Individualistic residential	*1,44*
Fatalistic non-residential	*1,55*
Hierarchic non-residential	*1,88*
Egalitarian non-residential	*1,38*
Individualistic non-residential	*1,43*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Fatalistic residential actors 2, Hierarchic residential actors score 2 as well, Egalitarian residential actors sore 1 and the Individualistic residential actors scored 1 as well. In the Non-residential category the Fatalistic non-residential actors score 2, Hierarchic non-residential actors score 2 as well, where Egalitarian non-residential score 1 and so do the Individualistic non-residential actors (1).

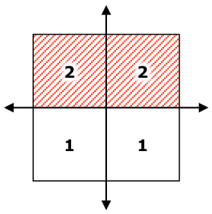

Figure 4.2a. Meanscores on the degree of perspectives in the category Residentials

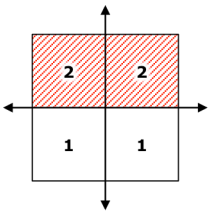

Figure 4.2b. Meanscores on the degree of perspectives in the category Non-Residentials

The results of this test show for this population a complete equal distribution of total perspective to the extent of rationality degree within the two archetypes. In this distribution the perspective degree of the Fatalistic and the Hierarchical rationalities are, with scores of 2, higher than the score of Egalitarian- and Individualistic actors. Who both score the lower mean of 1. Based on such a score the conclusion was drawn that the more grid-oriented rationalities (Hierarchism and Fatalists) base their worldviews and cultural biases for a larger share on *"attitude towards"* or *"how one thinks about"*. More value based so to say. Translated to the framework of Cultural Theory the analysis shows a picture as presented in the figures 4.2a and 4.2b.

Table 4.7. Perspectives; Score range and interquartile range

Archetype	**Score** *min-max*	**IQR**
Fatalistic residential	*1-5*	*2*
Hierarchic residential	*0-4*	*2*
Egalitarian residential	*0-6*	*1*
Individualistic residential	*0-4*	*3*
Fatalistic non-residential	*0-5*	*1*
Hierarchic non-residential	*0-5*	*4*
Egalitarian non-residential	*0-2*	*1*
Individualistic non-residential	*0-2*	*1*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

The interquartile range (IQR) for degree of perspectives that archetypes feature have been analyzed, and interpreted in the following way: Fatalistic residential actors (2) Hierarchic residential actors (2) Egalitarian

Table 4.8. Perspectives; Percentage (%) within the archetypes

Perceptions	**%**	**Archetype**							
		Residential				*Non-residential use*			
	of pop.	F-actor	H-actor	E-actor	I-actor	F-actor	H-actor	E-actor	I-actor
Risk	*8%*	*10%*	*20%*	*5%*	*4%*	*9%*	*25%*	-	-
Strict	*2%*	*3%*	*4%*	-	*3%*	-	*13%*	*13%*	-
Discipline	*2%*	-	*12%*	*1%*	*3%*	-	-	-	-
Caution	*8%*	*7%*	*24%*	*5%*	*3%*	*9%*	*38%*	-	-
Authority	*6%*	*7%*	*16%*	*3%*	*3%*	-	*25%*	*13%*	-
Fragility	*2%*	-	-	*5%*	-	-	-	-	-
Anxiety	*12%*	*17%*	*8%*	*14%*	*3%*	*9%*	*38%*	*13%*	*14%*
Equality	*2%*	-	-	*4%*	-	-	-	-	-
Value	*12%*	*12%*	*18%*	*6%*	*15%*	-	-	*25%*	*29%*
Environment	*42%*	*17%*	*32%*	*59%*	*24%*	*18%*	*25%*	*88%*	*14%*
Unlimited	*1%*	-	*4%*	-	*3%*	*9%*	-	-	-
Liberty	*9%*	*7%*	*8%*	*8%*	*18%*	-	-	-	*14%*
Success	*14%*	-	*16%*	*5%*	*50%*	-	-	-	*71%*
Performance	*1%*	-	-	*3%*	-	-	-	-	-
Self-determination	*4%*	*3%*	-	*2%*	*12%*	-	-	-	*14%*
Powerless	*8%*	*45%*	-	-	*3%*	*36%*	-	-	-
Distrustful	*6%*	*31%*	-	*1%*	-	*27%*	*13%*	-	-
Uninterested	*2%*	*7%*	-	*1%*	-	*9%*	-	-	-
Unknown	*10%*	*45%*	-	*5%*	*6%*	*18%*	-	-	-
Insignificant	*2%*	*14%*	-	-	-	-	*13%*	-	-

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

residential actors (1) Individualistic residential actors (3), Fatalistic Non-residential actors (1), Hierarchic Non-residential actors (3), and Non-residential Egalitarian actors (4) and Non-residential Individualistic actors (4). Most of the rationalities within the archetypes feature a score around the median (1-2), however two actor groups seems to exhibit a higher concentration around the median than other rationalities, namely the Individualistic residential group (3) and the Hierarchic Non-residential group (4). To draw conclusion on this pattern is a difficult exercise, because both groups are in every aspect (archetype, grid- and group feature) each other's opposite (table 4.7). The most obvious conclusion here would be that the results are based on coincidence.

To the extent of the search for "*…which specific perspective is typical for an archetype"* conclusions regarding this aspect of hypothesis 3 have been completely drawn from information gathered in table 4.8. So the analysis is done based on descriptive statistics and must give in sights in the score of degree of perspective within each of the rationalities of each archetype. The in this table (B.4) found patterns have been interpreted in the following way: Fatalistic residential actors see themselves as *powerless* and *unknown* (both 45% and 45%), Hierarchic residential actors mainly see *caution* as the best way of dealing with *environmental* circumstances (resp. 24%, 32%), Egalitarian residential actors are more *anxious* (14%) for any measure. So if any measure is taken, *environmental* protection (59%) should be involved. Individualistic residential actors see a measure rather as *success* (50%) for the *environment* (24%). The patterns found on the Non-residential archetype: the Fatalistic non-residential actor feels *powerless* (36%) which results into an attitude of *distrust* (27%), the Hierarchic non-residential actors feel the need for *caution* (38%) out of *anxiety* (38%) for circumstances in their spatial area, while Non-residential Egalitarian *value* (25%) their *environment* (88%) highly, so an eventual measures may under no circumstance diminish it. The Non-residential Individualistic actor sees environmental *values* (e.g. natural value or cultural heritage) rather as a chance to *successfully* improve the environmental circumstances (resp. 29%-71%). To the extent of perceptions it appears that the perception on e*nvironment* is leading (42%). This specific indicator has an almost four times bigger share than all the others. The later places serious question marks behind the operationalization of that indicator.

4.3.4 Hypothesis 4

Testing het last hypothesis (4) was about exanimating: *"A statistical correlation between the variable archetype of actor, and the preference of incentive such an archetype features*." In essence incentives are, impulses that can be deployed in order to stimulate cooperation for implementing river management measures; impulses that are prone to plurality. The specific assumption beneath the just named examination leads to the query: *"To what extent, do the assumed archetypes exhibiting shared preferences towards certain incentives*." Quite the same as in partial test 1, the initial idea was to prove this hypothesis based on a frequency table in which archetype data would be confronted to the data on incentives. The survey response presented in a cross table resulted into table 4.9. In this table (4.9) all the possible archetypes of actors are linked to in survey chosen preferred incentives. The idea behind the exercise was to expose patterns of preference for each archetype. However, to apply a solid statistical Chi-square test in order to test the significance and strength of this possible correlation, the merging of categories was again a necessary exercise. So the actual analyse has been done based on table 4.10.

To become able to preform a Chi-square test two necessary adjustment had to be made, namely: 1) *The incentives distilled from survey had to be merged into four broader categories of incentive type*, and 2)

Table 4.9. Incentives; Percentage (%) within the archetypes

Incentives	**Archetype**							
	Residential				Non-residential use			
	F-actor cases ratio (N) - (%)	H-actor cases ratio (N) - (%)	E-actor cases ratio (N) - (%)	I-actor cases ratio (N) - (%)	F-actor cases ratio (N) - (%)	H-actor cases ratio (N) - (%)	E-actor cases ratio (N) - (%)	I-actor cases ratio (N) - (%)
Risk & Safety	*3 - 12%*	*3 - 12%*	*10 - 40%*	*4 - 16%*	*2 - 8%*	-	*1 - 4%*	*2 - 8%*
Caution, Control & Expertise	*1 - 50%*	*1 - 50%*	-	-	-	-	-	-
Rules, Strategy, Strict, Discipline & Expertise	*3 - 6%*	*10 - 20%*	*25 - 49%*	*7 - 14%*	*1 - 2%*	*3 - 6%*	*1 - 2%*	*1 - 2%*
Fragility & Nature conservation	-	*1 - 7%*	*7 - 50%*	*2 - 14%*	*2 - 14%*	*1 - 7%*	*1 - 7%*	-
Value, Environment & Preservation	*2 - 7%*	*3 - 10%*	*19 - 61%*	*4 - 13%*	-	*2 - 7%*	*1 - 3%*	-
Care, Social-Spirited, Support & Equality	*2 - 7%*	*3 - 11%*	*14 - 50%*	*5 - 18%*	-	-	*3 - 11%*	*1 - 4%*
Progress, Opportunity & Improvement	*1 - 14%*	-	*1 - 14%*	*2 - 29%*	*1 - 14%*	-	-	*2 - 29%*
Commercial, Liberty, Unlimited & Opportunity	*1 - 100%*	-	-	-	-	-	-	-
Progress & Improvement	-	-	-	*2 - 50%*	*1 - 25%*	*1 - 25%*	-	-
Powerless, Unheard & Locked-out	*8 - 30%*	*1 - 4%*	*9 - 33%*	*6 - 22%*	*1 - 4%*	*1 - 4%*	-	*1 - 4%*
Distrustful, Unknown & Uninformed	*5 - 22%*	*3 - 13%*	*9 - 39%*	*2 - 9%*	*3 - 13%*	-	*1 - 4%*	-
Unfair & Undergo	*3 - 60%*	-	*2 - 40%*	-	-	-	-	-

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Table 4.10. Cross table; Incentive type vs. rationalities

Incentive types	Rationalities: Fatalistic Cases (N)	Fatalistic Ratio (%)	Hierarchic Cases (N)	Hierarchic Ratio (%)	Egalitarian Cases (N)	Egalitarian Ratio (%)	Individualistic Cases (N)	Individualistic Ratio (%)	Total Cases (N)	Total Ratio (%)
Incentives about robustness	*10*	*13%*	*16*	*21%*	*36*	*48%*	*13*	*17%*	*75*	*100%*
Incentives about protecting	*6*	*8%*	*11*	*15%*	*45*	*60%*	*13*	*17%*	*75*	*100%*
Incentives about possession	*4*	*33%*	*1*	*8%*	*2*	*17%*	*5*	*42%*	*12*	*100%*
Incentives about getting involved	*20*	*36%*	*5*	*9%*	*21*	*38%*	*10*	*18%*	*56*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Switching back to Rationalities instead of archetypes. That last exercise is a major clear-cutting to the test of hypothesis 4, however due to the presuppositions for a Chi-square test (Cochran), there was no other option but to reduce categories. The exercise of merging archetypes back into rationalities was defendable for the fact that: A) *Categories of archetypes are so limited and quite clear in their dominant rationality*, and B) *Most common perceptions and perspectives for each archetype has been tested in respectively partial test 1 till 3.* By merging the *incentives* into *incentive types* the detailing was given up anyway. Thus the here tested broad categories of incentive types who have been linked to rationalities, can in practice easily be assigned to the archetypes soon preferences are clear.

The preformed Chi-square test did not found significant relationships, $X^2(9)=29,3$; $p<0,05$, between *incentive types* and *rationalities* of actors who have property along the catchment of the river Kromme Rijn.

The analysis based on descriptive statistics by using cross table 4.10 revealed that Fatalistic actors prefer to get involved in planning, while Hierarchic actors rather prefer the guarantee of robust measures. The Egalitarian actor demands the protection of values in a plan, and the more Individualistic actor is sensitive for possession related incentives. Interpretations regarding the influence of the variable *incentive type* on the variable actor *rationality* have been made based on the percentages in cross table 4.10. The implication of the confrontation was about demonstrating that a certain kind of actor with a certain kind of rationality features a certain preference towards a certain type of incentive. The analysis of this table (4.10) resulted into the following interpretations: Within the for this research project considered catchment area of the *Kromme Rijn*, there are actors who feature a more Fatalistic rationality. This type of actor seem to have a much higher preference for incentives with regard to *getting involved with the plans* (36%) to the extent of *their possessions* (33%). The actors who feature a more Hierarchic rationality favor incentives regarding *robust measures* (21%) for *protecting environmental circumstances* (15%). At the same time the actors within this *Kromme Rijn* catchment area who feature an Egalitarian rationality, have a very clear preference for the *protection of values* (60%). These actors are more sensitive for *robust measures for protecting* (48%) those. The actors who feature an Individualistic kind of rationality have a clear preference for incentives with regard to *possession* (42%).

The assessment of this partial test (4) was conducted to demonstrate whether or not there is a statistical relation between the rationality of actors along the river *Kromme Rijn* and their preferred incentive types for cooperating with the implementation of planned river management measures. However these patterns face a risk to be based on coincidence, and thus claims drawn for this partial test on hypothesis 4 cannot remain uncritically. Further research based on a larger and more varying population is wished.

4.4 Synthesis

The overall aim of this research project was to establish a conceptual model that is able to contribute to the understanding, the analysis and to react on the problem of lack of cooperation with the implementation of river management measures. It is patently clear that the planning process of river management development faces stagnation during its implementation phase; the previously mentioned troublesome implementation of flood planes along the *Rhine* catchment is an exemplary example of this statement. The philosophy behind the project was that the knowledge gained through the here exercised research might contribute to the improvement of effectiveness of the planning/implementation process. One of the most elementary starting points of the project is that actors within a public planning process can not be seen as a homogeneous group, but rather as individuals who feature plural worldviews and biases. The core assumption that goes with that specific starting point is thus that plurality is a major cause of problems with regard to the effectiveness of *river management development planning processes*. The bottom line of this project is the statement that the here developed *"Prism"*-concept is capable to deal with that problem. The challenge of the project was obviously to prove that statement and convert it into a solid claim.

In essence the conceptual model comprehends the incorporation of three sub-phases into the larger implementation phase of a planning process. The stance is taken that by unveiling and then unraveling plurality into perceptions and perspectives, one obtains clues that can be deployed for reflecting in a more effective way towards the individual rationalities of actors that who have stakes in a planning area; rationalities towards the concerning development. Because by having insights into what moves the actors, with regard to their rationality, it would give the initiators of public work projects, instruments for defining specific incentives that stimulate cooperation with such development (e.g. river

management measures). Thus the core of obtaining a solid claim is about proving the concept by examining the three sub-phases that together form the model. The experimental phase of the research gives substance to that examination by applying the conceptual model into an actual river management development area. This testing ground was the *Kromme Rijn* catchment area; a planning area that is subject to EU based water tasks.

As the core aim of project was to prove the established conceptual model that should contribute to the effectiveness of public works planning processes – with the addition that the project only focuses on river management development –, the research strategy was about confirming the theoretical expectations of that model. Using theoretical knowledge as a starting point for solving the research problem implicates that a deductive approach is the appropriate strategy for research. In line of such a strategy the choice for an experiment correspondingly the Euclides-model was evident, because that specific strategy-model structures the operationalization of the experimental setup for obtaining observations. Baseline of the philosophical mindset behind this research is demonstrating the actual functioning of the three phases of the conceptual model.

With regard to the first phase of the model (Rationality-phase), the reasoning behind the concept was established around the contention that certain location types feature a dominant presence of a certain type of rationality. Thus the inquiry here was to prove to what extent it is possible to determine standardized archetypes of actors within a planning area. The theoretical framework of Cultural theory served the role as structuring mechanism that was capable to organize the plural social reality of a developing area by ordering of the actors according to their similarity in characteristics. So the use of Cultural Theory here is in a sense more a taxonomic exercise of dividing actors based on their perceptions and perspectives. Cultural Theory provides the criteria for such subdivision. The aim of testing the relation between *types of ownership* defined by *zoning*, and *type of rationality* defined by the *framework* was done in order to demonstrate that *it is possible to generalize residents of a certain catchment area into a standard set of actor archetypes*. The most important part of the findings from testing the Rationality-phase are the results of cross table interpretations. These were cross tables in where the variable *actor rationality* have been opposed against the variable *land-use* based on zoning, for obtaining percentages of representation of rationality type within the type of land use. Interpretations have been done based on patterns in dominant representation. Supported by a significant result out of the applied Chi-square test the claim drawn for this sub-investigation on the Rationality-phase is considered valid. And although the hope was to find a wider variation there is still a clear pattern in representation of rationality versus land-use found. Which is in line with the basic assumption for this phase of the conceptual model.

To the extent of the second phase of the concept (Communication-phase), it stands for the process of interacting on the expressed ideas and feelings of the specific actor types. Due to plurality the social reality of a developing area features a variety of perceptions and perspectives within the planning process. Such a variety will inherently cause difficulties in the process, because reflecting on just one of these *perceptions* or *perspectives* means fore filling the demands of a certain type of actor, but at the same time it implies neglecting the other actors. The underlying assumption of this phase was that specific perceptions and perspectives are exemplary for certain rationalities and thus can be assigned as typical to the in the prior phase demarcated actor archetypes. So the challenge for this phase was in fact to prove that typical characteristics go along each specific actor archetype; characteristics with respect to both perceptions and perspectives. Although both perceptions and perspectives contribute to the actor's rationality each have been tested separated. This separation stems from the fact that measurements on perceptions where based direct indicators who literally could be distilled from literature, while measurements on perspectives where more based on the storyline of Cultural Theory. Direct indicators feature more material status and therefore thus applicable in more tangible incentives like e.g. safety- or mitigation programs. Indirect indicators however are more value based.

An insight in such a subdivision provides equipment for formulating more effective incentives, because some rationalities are more value orientated, while other rationalities are more sensitive to material based encouragement. The core of examining the Communication-phase where statistical analyses using descriptive statistics on frequency tables. Two separate frequency tables have been drafted in where the scores on either the *degree of perception or* the *degree of perspectives* have been compared to the *rationalities of actors*. From these frequencies the arithmetic mean of representation of perceptions or perspectives within each of the rationalities could be distracted. This information could be interpreted into figures that imaged the framework of Cultural Theory. By exercising this method both patterns on 1) *Favored rationality indicators* and 2) *The rationality orientation* (material or value), could be disclosed. So in a certain sense the test supported the claim on the Communication-phase of the concept. Unfortunately, the ANOVA-test preformed in order to get certainty about found patterns revealed that *only the frequencies on perceptions featured* significantly differences, which implicates that found patterns, feature no certainty and risk to be based on coincidence.

The third and last phase of the model (Cooperation-phase) should be responsible for the actual act of gaining cooperation with the planned measures. The assumption here was that administrating specific strategies that respond to the rationalities of the different archetypes of actors will increase the chance on cooperation. So the search here was to prove t*o what extent archetypes exhibiting shared preferences towards certain incentives*? To obtain information for testing this Communication-phase a pallet of twelve pre-defined and contrasting incentives have been presented to the actors. These contrasting incentives were operationalized based on the storyline of literature by Schwarz & Thompson (1990); three specific incentives for each of the four rationalities. So theoretically each of the rationalities of Cultural Theory should find recognition in at least three of the pallet's pre-defined incentives. The aim of the examination of this phase was about finding *a relation between the archetype of actor, and the preference of incentive such an archetype features*. Findings from testing the Communication-phase have mainly been the result of cross table interpretations. In this table the rationalities have been linked to the preferred incentives. Interpretations have been done based on patterns of highest scores *incentive type* in the *rationality* categories. This interpretation exercise was followed up by a Chi-square in order to

validate the claim drawn for this sub-investigation. The assessment of the cross table demonstrate a relation between the rationality of actors and their preferred incentive types based on found patterns in percentages. However the preformed Chi-square test did not found significantly. Thus the observed patterns risk to be based on coincidence thus claims drawn for this partial test on hypothesis 4 cannot remain uncritically. Further research based on a larger and more varying population is a necessary exercise to arrive at a solid claim.

The general conclusion of this synthesis is that: 1) *Descriptive statistical analysis endorse the earlier claims regarding the concept*. However, the high level of homogeneity of the tested population resulted into marginal contrasts, which had implications for the statistical tests that should validate the found patterns. This means that: 2) *Inductive statistical tests emphasize that there is still a risk of coincidence*, which implicates that claims cannot remain uncritical. The overall conclusion here can only be that there are clues that the concept indeed is contributes to the understanding and the analysis of the problem of lack of cooperation with the implementation of river management measures, and also is capable of reacting on that problem, but to arrive at a fully valid claim the concept has to be tested more extensively.

4.5 Applicability

The last two chapters (3 & 4)/papers (2 & 3) mainly focused on the methodological elaboration and analysis of the experiment on the *"Prism"*-concept. In this sense, most of this research project has been an exercise in the context of scientific relevance. Although the first phases of the concept has not been fully approved by significant results, in order to complete a full elaboration on the concept this specific section deals with the inquiry on how the acquired knowledge can be further differentiated into an applicable strategy. In the conceptual model such a strategy is represented by the closing prism (figure 2.4, 4.3). This would be then a strategy to overcome the research problem of lack of cooperation so to say. To explain this, a small step will be taken into the matter of traditional land acquisition for public work development in general, all in order to outline the context and meaning of the advantages of an alternative land policy for water management. After that theoretical exercise, the acquired knowledge will be hypothetically implemented in a land acquisition strategy.

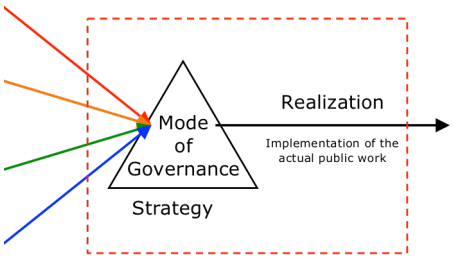

Figure 4.3. Application of the "Prism"

For this, an example of a recent KRW project in the Kromme Rijn catchment area (2014) will be available in appendix E. The later exercise will be done in order to outline the social relevance of the knowledge that has been drawn from this project in a practical way.

4.5.1 Land policy

As discussed in prior sections of this bundle, for the implementation of river management measures the water manager has not always access to the space required for the development of measures. Just as the land-use planner, in order to achieve objectives (e.g. WDF- or FMD-tasks) the water manager has to act as an entrepreneur in the planning area; where many other interests also play a role. Thus regarding the claim for space, the importance of water management or water safety will be balanced against other interests, e.g. economic interests (section 1.3, 2.2 and 2.3). Another important aspect that the initiator receives recruitment during land acquisition, is the influence of legal functions on land-use, often laid down by an local act in zoning plans. This feature has a major impact on the possibilities for using the land plots. In general the development, management, and use of land resources can be approached in a logical and straightforward manner: *"What can and should be done depends on what is technically, physically, and biologically possible and on considerations as to what is economically feasible and institutionally acceptable"* (Barlowe, 1978). To that extent, land-uses and property rights can be seen as externalities (e.g. Demsetz, 1967). Because these land-use possibilities are inextricably linked to the market value of a land-plot. These costs (or benefits) affects the initiator of a public work because as these parties do not choose to incur that cost/benefit of the parcel; the land is being used for public interest (e.g. flood risk protection) and intrisically governmental actors are averse from economic interests. Thus, in need for space, the public initiator is subjected to economic mechanisms (instruments like expropriation, are as discussed in paragraph 2.3.1, disregarded in this research project). Additionally, the negotiation position of an initiator will often not be very strong; supply and demand are unilaterally, in a sense that the initiator wants something of a specific actor, who has a from that moment the real asset. This whole of factors makes the deployment of just the traditional incentives of (financial) compensation and land readjustment a less attractive option because the land acquisition exercise is strongly influenced by an unequal market economy. Note that as a result of such a market mechanisms the effectiveness of traditional instruments will increase as soon as cooperation becomes lucrative for those involved; profit will become the incentive to gain cooperation instead. This implicates that the allocation of measures at certain locations can result in unlawful advantage and an ineffective development costs. The social desirability of that phenomenon can be a questioned.

Contrary to the purely use of traditional incentives, a consensual- or participatory approach is not yet very common in the land acquisition process for river management measures (appendix A, pp.73-74). This refers to the fact that till to date, social aspects, such as civil involvement have not yet been fully utilized. Opposed to the traditional market-oriented approach, such an approach addresses social mechanisms like e.g. confidence, involvement and conviction or trust, instead of the just discussed economic incentives. An important part of this research has been to investigate the extent to which integration of participation indeed can be a fruitful addition to the current planning process of river management measures. To be more precise, *the influence of perceptions and perspectives on the willingness to cooperate* have been investigated. Such readiness should then work through the land acquisition

process. In order to outline how a acquisition process incorporates this mode of operation, the following section elaborates on a suggested strategy which is based on the knowledge gained during this project. This exercise is also intended to explain the last part of the *"Prism"*-concept.

4.5.2 Land acquisition strategy

The findings of the research so far are mainly focused on the operation of the conceptual design. Based on these results, the following insights have emerged: 1) *It is possible to make a (rough) subdivision into archetypes based on land-use and zoning*, 2) *Each archetype feature to some extent homogeneity with regard to rationality by shared perceptions and perspectives*, and 3) *Each archetype has a certain sensitivity to particular incentives.* The here elaborated final stage of the *"Prism"*-concept is raised to actually deploy this knowledge in order to deal with a certain stagnation during the planning process in a sense that the exercise is intended to facilitate a cooperation strategy (figure 2.4; 4.3). A stagnation due to lack of cooperation, which is assumed to be the result of traditional strategies that not (always) fit the prevailing rationalities of a planning area. In this project it is suggested that a strategy based on the just gained knowledge will fit those rationalities better, and thus increase the chance on cooperation. In the following subparagraph there is a brief explanation on how such a strategy could be formulated (in appendix E, there is a complete expansion of the here proposed strategy based on an practical example of a 2014 WFD-project in the Kromme Rijn catchment area). Because not all the results have been proved significantly, and additionally, the researched population along the Kromme Rijn catchment area turned out to be rather homogeneous, the elaboration on the next strategy remains in the hypothetical atmosphere and the exercise is quite shallow. However to complete a full eleboration this phase of the concept can not be left out.

The here supposed acquisition strategy design is built around the three core insights the project has gained, and comprises basically the three phases of the conceptual model: 1) *Rationality (demarcation)-phase*, 2) *Communication-phase*, and an 3) *Cooperation-phase*. To complete the suggested strategy the additional 4) *Governance-phase* is introduced (figure 4.3; 4.4). In substance, these phases involve the following content:

1) Rationality (demarcation)-phase: During this fist phase of the strategy the planning area needs to be divided into archetype allocations based on land-use and zoning. This exercise gives content to the Rationality-phase of the conceptual model and is based on the insight that is gained by testing Hypothesis 1 - *"It's possible to classify types of actors (archetypes) based on the functions or land-uses of their plots, and generalize specific rationalities towards these archetypes".* Build on the results of the during this project performed experiment, the planning environment of the Kromme Rijn catchment would contain just two archetypes, namely: *Residentials* and Non-residentials. However it is expected that a less homogenous population features a more differentiated spectrum of archetypes like: *Agricultural entrepreneurs* who have a stake in their business management, *Nature management organizations* whose existence is based on the protection of natural values, *Residing citizens* who will fear for both the quality and safety of their living

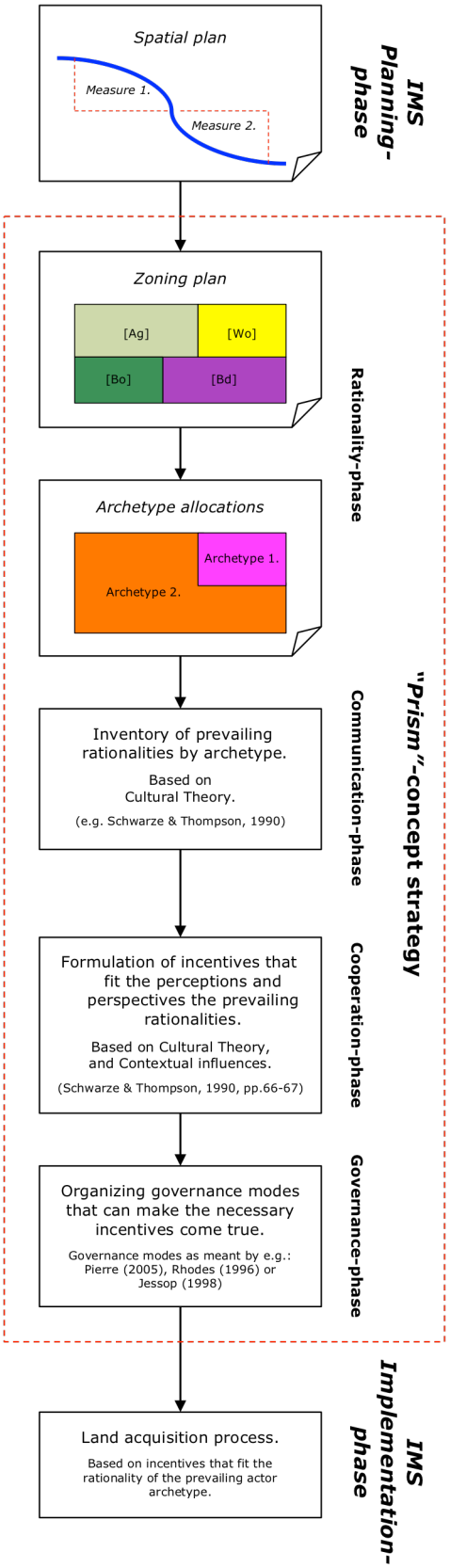

Figure 4.4. Strategy based on the concept

environment or *Critical governmental institutions* whose legitimate task is to guarantee certain public affairs (e.g. safety) – sometimes the interpretation of these institutional tasks are subjected to the political agenda of a board (e.g. the *Duurzaamheids Agenda* (2017) of HDSR [Sustainability Agenda]);

2) Communication-phase: The second phase of the strategy deepens the demarcation by determining rationalities that fit the archetypes. Reasoning from Cultural Theory each archetype should feature to a high extent the same rationalities due to the fact they are all located on property that has the same legal functions. Such legal functions determine the possibilities for using the property, and it is that land-use that can be related to the rationalities the actors will feature. Because the exploitation of that use will come with certain interests who are typical for that practice (e.g. *Schwarz* & *Thompson*, 1990; Thompson et al., 1990; Douglas, 1999). The experimental part of this project was initially set up to backup the statement on the relation of land-use and rationality (by Hypothesis 2 and 3). However due to previously mentioned reasons, the results of just two archetypes for the Kromme Rijn catchment where too shallow to serve as a solid example. To depict this statement properly an agricultural land-use function will be introduced to elaborate as an example archetype;

Due to the legal function (zoning) of these agricultural types of land plots one may expect that only agricultural entrepreneurs will settle on such parcels and therefore the area can be demarcated as archetypical, because the intrinsic aim of this archetype of actor is to engage in agricultural activities. Thus in terms of rationality – towards their property – these actors will mainly focus their perceptions and perspectives on agricultural entrepreneurship. This implicates that a requests for a piece of their agricultural land on which this type of actor undertakes a business, will directly impact their enterprise. To illustrate, the activities of a Dutch dairy farmer are subject to the Dutch Order in Council *Grondgebondenheid* (2016) [Dairy Cattle Act], which connects the activity to a location (e.g. Koole, n.d.). To act as a dairy farm, the entrepreneur needs to demonstrate they have sufficient hectares of land because of the manure surplus such enterprises produce (Meststoffenwet, 1986, art 9.) [Manure Surplus Act]. This implicates that the size of the livestock at a company level – by manure production rights – are directly linked to the size of the actors estate. The classical incentive of land readjustment often does not always bring solutions because the *Wet Verplaatsing Mestproductierechten*[5] (1993) [Act of Movement of manure production rights] prohibits the transfer of manure production to another location. The (financial) incentive of compensation is not fully effective because the market value of a square meter agricultural land does not equal the business revenue that guarantee the entrepreneurs livelihood; as the revenue is usually a straight derivate of a companies livestock size. To arrive at cooperation, incentives that deal with these dilemmas may be more effective for actors who are united in this archetype, instead of incentives that rather create problems.

The same underlying thought towards the classic incentives may apply to property that has e.g. the land-use function *"Nature"*. The actors within such an archetypical area may not so much care about land readjustment because of the biological location factors their specific land-plot may represent (e.g. Alkaline malignant groundwater currents). A fragile ecological-system simply can not be moved from one place to another. So the reasoning behind the demarcation exercise that represents these two phases arises from the idea that the actors who uses their land for same function feature the same rationality, because they share the intrinsic purpose of owning the land. This purpose follows the legal possibilities of the land-use. Which implicates that to a reasonable extent a demarcation of rationality can be distilled from a zoning plan.

3) Cooperation-phase: In the third phase of the strategy the incentives that fit the rationality have to be formulated. For this exercise one has to be aware of factors that influence the fit of such an incentive. During this research it is stated that the prevailing perceptions and perspectives of the archetypical actor have a dominant influence on the demands on the fit of an eventual incentive. However another important factor that stimulates certain demands regards the contextual variables which comes with the function, enterprise or daily practices of a certain archetypical land-use. The influence of perceptions and perspectives have been elaborated extensively during the theoretical phase of this research project (chapter 2/paper1). Nonetheless, contextual influence are by no means also an aspect of the complex social reality where a spatial area and thus its actors are subjected to. Multiple publications on spatial development mention the influence of context on land policy (e.g. Brody, 2003, [nature management]; Buitelaar et al., 2010, [governmental land policy]; Hartman, 2011, [social construction]; Agricola et al., 2010, [spatial effects of agricultural progress]). It has to be emphasized that an extensive and substantive elaboration on this broad subject reaches beyond the scope of this research project but the tremendous body of literature about this aspect justifies the statement of the importance of contextual influences. The result of the experiment on the Kromme Rijn catchment where once again to broad to serve as a good example of the implications of the here elaborated strategy. So once again the hypothetical example of the Agricultural archetype is used to explain how the Cooperation-phase of the strategy comes to a formulation of a fitting incentive;

As previously mentioned the actors in the Agrarian archetype will focus their perceptions and perspectives on their agricultural entrepreneurship, and a request for a piece of their agricultural land directly affects their agricultural business. So with regard to the aspects of perceptions, perceptions and context that have been addressed in order to accommodate the formulation of an fitting incentive, the establishment of it should be build on both the rationality of an entrepreneur and the contemporary agricultural context for that area. To support that statement the following subparagraph illustrates it by elaborating on the situation in the Kromme Rijn area.

With regard to perceptions and perspectives, an agrarian is in first and foremost place, an entrepreneur. Thus it is logical that such an actor has been classified within a rationality stemming from individualism. A further considerations of the contextual situation of the agricultural sector along the Kromme Rijn catchment area indicates that despite the fact that the agricultural sector is currently in crisis, most rural municipalities still

want to stimulate investment in the agricultural sector. For example, the municipality of Houten has set itself the aim of modernizing the agricultural sector within its management area, with the underlying policy purpose that this sector can act as the economic bearer of the area (Houten, 2011, p. 63). The municipality of Houten therefore regards a strengthening of the agricultural sector in their area as an advantage. To stimulate such a development, an area must comply with a number of preconditions. There must be clarity, whether there is space for scale expansion within a municipalities management area. In addition, competitive claims on space may have a negative effect on the scale expansion of agricultural companies. However the innovative development of mega cattle stables gives new perspectives on scale expansion within the agricultural sector (e.g. Doorn, 2011). Taking into account both the perceptions and perspectives of the opportunistic character and the laissez faire attitude of an individualisic actor and the just discussed agricultural context of the Kromme Rijn area a promising incentive could be a permit for the construction of a mega cattle stable[6,7] (Schwarz & Thompson, 1990, pp.66-67).

Obviously a initiating water managing institution is not the legal institution that issues build- and environmental permits, however the last decade a historical development in the Dutch planning approach took place. Instead of rational planning a shift towards communicative and interactive planning (integral area development) was integrated (e.g. SER, 2004; VROM 2009). Additionally, due to the need for climate adaptation the theme of water was chosen as one of the major structuring principles for spatial arrangements and the use of land (Rijksoverheid, 2006). In short, the process of integral area development is increasingly becoming the approach of planning. This implicates that planners no longer can focus on just one sectoral theme, but taking strategic- and consensual planning approaches as a starting point for achieving objectives. Which makes it possible to integrate project management into spatial development. A key design principle during an integral area development approach regards good collaboration between the various institutions that are associated with managing the area; especially for the sake of coordinator for a good coherence between the multiple spatial functions, and for providing a good basis for managing the complex process (Bruijn & Heuvelhof, 1999). Additionally, this collaboration in planning opens doors to both discussing possibilities and finding partners – municipalities in case of the development of mega stables – for a comprehensive land acquisition strategy that can deploy incentives like permits for agricultural development.

Note that only the hypothetical example of an agricultural archetype has been elaborated here the same kind of complex incentive formulation process holds for other kind of archetypes.

4) Governance-phase: The fourth and last phase of the strategy is introduced to actually arrange the formulated incentives. During this additional exercise governance modes[8], that will be capable to both organize the actual establishment of an incentive and secure a legitimate implementation of it, have to be composed. Especially for the more comprehensive incentives that are based on goods and services who are outside the influence sphere of the initiator (e.g. permits). Another important aspect here is the eventual external influences on issuing the actual incentive, like opposition groups who e.g. oppose against the development of mega stables. In order to arrive at a sustainable establishment of an incentive these influences have to be taken into account too. Note that the elaboration on the concept of governance itself, as on the modes of how to organize it, is beyond the scope of this research project, other than that the application of governance modes is part of the conceptual model (figures 2.4, 4.3). So the following elaboration on governance serves purely as an illustration of what the practical application of the phase implicates. Along with that it is assumed that integrated area development[9] is *"business as usual"* for the initiator.

The term governance is a widely used and has a fairly common understanding that is applied by many fields (e.g. Political sciences, Public- and Business administration sciences, Urban- and Regional planning). In order to clarify what governance means for the here presented strategy, below there will be an explanation of how the idea of governance is understood during this project. Where after an explanation of the meaning of different modes for this specific strategy will be given.

The first point is that, as already noted, certain incentives may lay beyond the influence sphere of an initiating party. Thus up to here the question of how these incentives can be organized is still open. During the practical application of the conceptual model, this is a question that is important because the organization of incentives can not be arranged for each archetype in the same way. This is because each archetypal incentive is different in nature. To illustrate this, another brief description on one of the possible archetypes in a planning environment will be made. Up to now the strategy in this section has mainly been explained based on the Agrarian archetype, but as elaborated in section 4.3.1. there also may be a Residential archetype for the zonings with a residential function (for such an archetype, clear results have found during the experiment on the Kromme Rijn catchment). During the experiment this Residential archetype in particular took an egalitarian rationality, where a perception of the importance of preserving existing values applies, and a perspective of protection of these values prevails (paragraph 4.3.2 and 4.3.3). Incentives for this specific archetype should therefore be sought in the prevention of losing values (e.g. mitigation), or bringing back the lost of cultural/natural/environmental values (lost of values as a result of the implementation of a measure). In order to get this actor group involved into cooperation, contributing to the living environment might be an solid incentive. The latter requires amongst other things participation of the actors in a plan (e.g. Arnstien 1969). However, this incentive calls for another mode of governance. A governance mode in where the Residential actor has a (to some extent) a stirring role next to the initiator.

Fitting modes of governance

The aforementioned implicates that initiators have to determine on how their acquisition strategy will be organized. This subsection is intended as a consideration on two prevailing approaches within the planning paradigm of governance which can be organized in various ways; only for the Netherlands one can already divide five modes of governance (Driessen et al., 2011). So this subparagraph will mainly serve as an illustration of possibilities on how to apply modes of governance. In

that sense just two elementary perspectives on how one can organize governance will be given in order to give an idea on how to arrive at sustainable incentives. Note here that one approach is not necessarily a contradiction towards the other. Nevertheless when one tries to reach a planning goal – the implementation of a measure in case of this research project – a choice on how to organize the course to that specific goal should be made. In terms of the raw interpretation of governance in this research project the following definition is used:

> "*…the process of coordination and steering the urban society collectively toward defined goals*" (Pierre, 2005, p.448).

Two important perspectives on governance, concerning the organization of incentives for the here elaborated archetypes, are: 1) Governance-as-networks perspective recorded by Roderick Arthur William Rhodes (1996), and the 2) Political-economy-approach towards governance (multi-scalar meta-governance) by Bob Jessop (1998). Both perspectives will be outlined based on the two in this paragraph mentioned archetypes.

1) Governance-as-networks: One can say that the overall philosophy behind the approach is an emphasized on *"less rowing"* and *"more steering"* (Rhodes, 1996, p.655). Less rowing refers to less governmental influence, and more rowing on more collaboration towards set goals. In this understanding of governance one should always be aware of the principles of democracy. In fact this approach considers governance as a network in where actors are linked to each other; a network in where everyone has to work together because no one has all the information (e.g. on local values) nor access to all the resources (e.g. land). Both goods are needed to achieve the set goals in a sustainable way. To conclude governance-as-networks could be seen as less state involvement in favor of more civil involvement. In a situation where there is no actor who has the total knowledge or power to achieve (collectively set) goals. With keynotes that this approach leads to the need of *"trust"*. Trust to share knowledge and power, and to some extent self-organization;

Translated to the situation in where an initiator has to deal with the Residential archetype of actors, this approach implicates that the definition of conditions that fits the residential actors, such as spatial values (e.g. natural and cultural values or environmental quality), belongs to their knowledge. These actors also have access to the resources that the initiator need, namely the land for implementing the planned measures. Thus in case a planning area belongs to the Residential archetype, organizing the incentive of participation along a governance-as-network approach can be seen as a sustainable mode for establishing it.

2) Political-economy-approach: The philosophy behind this particular approach is based on considerations on arrangements (modes) of governance and the levels of communication. The approach considers a general distinction of two governance modes; a *"Market"*-mode and a *"State"*-mode [governmental mode]. And then comes up with a third *"Middle way"*. The later would be an arrangement between the market- and the state. Furthermore the approach assumes a distinction in communication levels. From the perspective that general communication takes place on both an *"Individual"*-level, an *"Organizational"*-level and a level in where different organizations are communicating with each other, which is referred to as *"Multi-scalar meta"*-governance. According to governance as a political-economy approach in basic there is a distinction between hierarchical state modes that are organized on the base of exchange and hierarchy on the one hand, and market modes that are coordinated by economic activities on the other hand. This Political-economy-approach would then be the third middle way that bring them together.

Translated to possibilities for organizing incentives, in case of the Agrarian archetype, economical activities are shaping the mode of governance soon these kind of actors individually organize themselves into networks. An association like the Dutch Land and Horticulture trade organization (LTO Nederland), who protects the economic interests and social position of agrarians in the Netherlands, would be an evident network for the Agrarian archetype. So negotiations and the definition on conditions for incentives that fits the archetypical agrarian actors, such as alternatives for the lost in revenue (e.g. by mega cattle stables), belongs to the scope of this so called market governance mode. At the same time, considerations on e.g. desirability of mega cattle stables on wider spatial context, belongs to the governance mode of municipalities. Reasoned from the here elaborated governance approach these institutions are organized in the hierarchical state modes. In case of an archetypical agrarian planning area the establishment of incentives can thus be arranged based on a multi-scalar meta-governance mode that represents the Political-economy-approach. It has to be noted that literature mentions for this third middle way a certain risk of coordination problems, so there is a need for a party who keeps a general overview (Jessop, 1998, p.42-43). Within the mode such a party would have the function of an objective overarching moderator.

4.5.3 Resume

To resume, to a large extent the main focus of this research project has been on the elaboration, experimentalization and analysis of the *"Prism"*-concept. Which basically has been rather an abstract exercise in contra diction to the real life problem of *"Lack of cooperation"* initiators of public works face during the implementation of their projects. In order to give the concept some more practical substance this section has been written. Besides, this section also gave content to the last part of the conceptual set-up, namely the closing prism that stands for the application of governance (figure 2.4, 4.3), which was a necessary exercise to complete a full elaboration on the model. To summarize, up to this section, the research project gave content to the Rationality-, the Communication- and Cooperation-phase of the set-up, by explaining how a spatial area can be divided into entities (archetypes) that feature communicable characteristics (perceptions and perspectives) that in their turn can be addressed in order to gain cooperation by fitting incentives. However in reality incentives are not self evident for the fact that issuing some of these are sometimes outside of the influence sphere of the initiator. Nevertheless, in perspective of the shift from a sectoral approach towards a more integral area development approach, this does

not necessarily have to be a problem anymore (SER, 2004). Reasoned from this wider perspective on planning, collaboration with institutions who have access to desired goods and services is becoming increasingly a natural way of working, as these institutions may have desires too (e.g. a policy to reinforce the agricultural sector). What remains is that the establishment of such incentives still is an exercise of customization for the fact that the fit of an incentive is a product of plurality. This makes the need for governance modes important, because such modes are capable of organizing the different parties (e.g. municipalities, trade organizations or interest groups) for the sake of a sustainable establishment of desired incentives. Note that the concept of governance is seen here as *the process of coordination and steering society collectively toward defined goals*.

So elaborating the for this project developed *"Prism"*-concept, the Governance-phase was the missing link back towards the actual IMS project cycle (figure 4.3). In such sense that after arriving at the establishment of an incentive its is assumed that the desired cooperation will be reached.

4.6 Conclusion

The core question of the overall research project was: *"How to stage cooperation for implementing River Management Development measures?"* This question stemmed from the notice that the usual strategies quite often result into stagnation of the planning process, because of lack of cooperation. So in fact aimed result of the project is to improve on effectiveness of the planning process. In essence this phase covered the results of the experiment. The research question: *"To what extent is the concept capable to improve the effectiveness of the planning process of river management development?"* should assist this inquiry. Answering this question is done in an indirect way by elaborating both the path towards the experimental phase of this project and its result. Indirect because the experimentalized conceptual model was indeed about incorporating the actor perceptions and perspectives, but the focus of this paper was more about analyzing how the model performed during the experiment. However from the result of this analysis an answer to that question cannot be drawn.

4.6.1 Further research

In general terms the outcome of the experiment could be formulated as: Based on descriptive statistics there are clues that, 1) *Actors within a river management development area who share same location characteristics to the extent of zoning, can be categorized into archetypes*, and 2) *When it comes to cooperation for river management development these archetypes of actors share to a large extent the same preferences for a certain category of incentives; communication strategies so to say*. In both cases Cultural Theory was the device by which the categorization could be made. These two clues embody the concept, so in that sense the answer to the research question could be answered positively. However the research population was found not to be distinctive enough to translate the results into a solid claim. Therefore, the conclusion for this project can not be other than there are good grounds to have expectations that Cultural Theory is able to *improve the effectiveness of the planning process of river management development* but to arrive at a full claim further research is needed.

Notes

1 ARD Brennkpunkt: This is a prominent German newscast that will be broadcasted for important events and will complement the coverage of the latest news releases. In the period between 2 and 12 June, the Arbeitsgemeinschaft der Öffentlich-Richtfichen Rundfunkanstalten der Bundesrepublik Deutschland (ARD) reported the high-water issues in Germany (2013) in a series named Hochwasser in Deutschland (ARD, 2013);
2 The *"Room for the River"*-program: The national flood risk management program of the Netherlands. The program involves a strategy based on natural dynamics. Such a *"Working-with-nature"*-principle is an approach, that uses natural dynamics; e.g., wind, water, sediment and vegetation which could lead to a positive effect on the nature. Working based on natural dynamics contribute to multifunctional land-use, such as nature development, flood risk management, freshwater supplies, fisheries, recreation and infrastructure (STOWA, 2013);
3 Valid dataset: Based on a calculation by *SurveyMonkey* the exact numbers of response would be 210, this number was based on a Population of 458, a Confidence level of 95%, and a Margin of Error of 5%. (SurveyMonkey, 2016);
4 Cochran-rule: Presuppositions for preforming a Chi-square test are: 1) All expected cell frequencies are greater than or equal to 1, and 2) Up to 20% of the expected cell frequencies lie between 1 and 5 (Field, 2013, p.742; Vocht, 2013, p.151; Vocht, 2015, p.144);
5 Wet Verplaatsing Mestproductierechten: The original *Wet Verplaatsing Mestproductierechten* has now been withdrawn, with the entry of the *Besluit Landbouw*, which in turn has been replaced by the *Activiteitenbesluit* (Kenniscentrum InfoMil, n.d.);
6 Mega cattle stable: Stables that are capable to house a large number of animals in one place. This means one large stable, possibly with multiple floors or one concentration of smaller stables on the yard. Both of these appearances are known as mega cattle stable (Alterra, 2007, p.9);
7 Opposition to the development of mega cattle stables: Residents of a rural area are often afraid that the development of such a large building will affect their living environment (Alterra, 2007, p.41);
8 Governance modes: *"Multi-organizational partnerships are now an important means of governing and managing public programmes"* (Lowndes & Skelcher, 1998, p.313);
9 Integrated area development: *"... the art of connecting functions, disciplines, parties, interests and cash flows, from a perspective to the (re)development of an area"* [translated from Dutch] (Zeeuw, 2007, p.7).

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Ch.5 Conclusions of the research project: *A Consideration on the Theory and Experiment, on the Problem and a Proposal on Further Research*

This final concluding chapter of the thesis-bundle elaborates on the conclusions from each of the three papers/chapters that together reported on this research project. This chapter starts with answering the analytical questions of paper one, which was formulated in order to give content to the theoretical framework of the project, and seeks answers to both the difficulties of the planning process of river management development, and how can Cultural Theory contribute to reduce the research problem. Where after successively answers on paper (chapter 4) two on the experiment and the interpretive questions of the third paper on the results of that experiment, will be elaborated. By answering on these introductory and more analytical questions it must be possible to arrive at an answer to the primal question of this project. This primal question was formulated as:

"What approach gives substance to lack of cooperation, and How to react to this phenomenon?"

In addition, this thesis was mainly devoted to the practical application of river management planning; because the project was commissioned and funded by the HKC some focus to their scope of practice was desired (appendix A). However, the gained knowledge should be applicable to all fields of public work development. And finally, a number of advisory recommendations for doing further and more extensive research on the basis of the lessons learned during this project.

5.1 Considerations on the theory

During the first phase of the research project the research problem: *Lack of cooperation with the implementation of River Management Development* have been outlined and considered. Where after further theoretical considerations, with regard to that problem, have been made in order to explain the phenomenon. These considerations where based on existing theory, which is *Cultural Theory*. The reason why *Cultural theory* is seen as an answer to the problem is because it explains *lack of cooperation* by considering that phenomenon as a product of differences in rationalities. The framework of Cultural Theory gives insight in these differences by labeling these rationalities. The analytical question that needed to be answered here was:

> *"What difficulties does the implementation process of river management development measures bring, and How can Cultural Theory contribute to the effectiveness of its planning process?"*

Basically this question contains two parts; firstly a *'What'-part* which addresses the difficulties during the River Management planning process that compromises its effectiveness. And secondly a *'How'-part* that elaborates a conceptualization of *Cultural Theory* that could lead to a solution that breaks up with those difficulties and thus improve the planning process.

5.1.1 Difficulties for planning

To the extent of answering the *'What'*-part, the conclusion drawn here is that lack of cooperation by the involved actors is a dominant factor in the time overrunning problem of public work development. This lack is mainly caused by a public interest contradicting a self-interest that utterly may result into opposition (e.g. Knippenberg et al., 2003, p.6; Werf, 2003, p.149; Struiksma et al., 2008, p.7; Neuvel & Knaap, 2010, p.10; Groot, 2012, p.8). It is this kind of opposition that makes the planning process of river management development a complex exercise. Traditional strategies in order to gain *cooperation* for implementing public development are often based on two incentives, namely *land readjustment* and *compensation*. However these do not necessarily guarantee willingness to *cooperate*. A clear conclusion here is that, *land readjustment* and *compensation*, may not unquestionably be the *"only"* key to realization of public work development. However these two incentives do not necessarily guarantee willingness to *cooperate*. A clear conclusion here is that, *land readjustment* and *compensation*, may not necessarily be the only key to realization of public work development. One of the assumed gaps within the planning process is that participation, like involvement of *worldviews* and *cultural biases*; in order to convince and gain trust is currently not a widely used incentive. The main conclusion to the *'What'*-part would be that the current acquisition strategies within the planning process are not always sufficiently able to respond to the different beliefs and different attitudes. Thus: *"Inability to respond to the different perceptions and perspectives causes this lack of effectiveness"*.

5.1.2 Solution for planning

With regard to the *'How'*-part of the question, the theoretical framework of *Cultural theory* is believed to be capable to respond to different *perceptions and perspectives* for the fact that it is based on plurality. The framework not only acknowledges that actors are not a homogeneous group, but also gives insight into their *perceptions and perspectives*. However, the basic framework by *Schwarz* & *Thompson* (1990) is not entirely appropriate to apply instantly into the planning process, because the framework gives indeed insights into plurality, but it does not give answers on how to respond correspondently to these *perceptions and perspectives*. With purpose to fill this gap the conceptual model ("Prism"-concept) has been developed for this project. In its essence the model is an

operationalization of *Cultural Theory* towards the planning process. The philosophy behind this *"Prism"*-concept is that soon the actors rationality is unrevealed it is possible to reflect on that rationality by deploying incentives that respond on that rationality. The concluding remarks on the *'How'*-part of the question is that *Cultural Theory* can be operationalized into a concept for analyzing and understanding plurality in a river management developing area. These insights then can be used to develop tailor-made strategies that fit the prevailing rationalities. Thus: *"Responding to the perceptions and perspectives of the prevailing rationalities increases the chances of cooperation"*. At least that's the theory.

5.2 Considerations on the method

The second phase of the research project considered the challenge on giving substance to the testing of the in phase one developed conceptual model. In essence during this first phase of the project two assumptions have been made: 1) *That a consensual approach will utterly be an improvement for the river management planning process*, and 2) *Lack of cooperation is caused by the fact that not always the right path of communication towards the actors is followed*. Strategies fail to respond on the prevailing rationalities so to say. These two assumptions led to an search that seeks a method to prove the theoretical reasoning. The (research) question that supports this inquiry was formulated the following way:

"What approach gives substance to theory, and How to encapsulate the concepts?"

Also this second question contains two parts namely; a first *"What"-part* which addresses topics like, research design, data collection, method and validity. Where after the *'How'-part* elaborates on the operationalization of the *theoretical concepts*.

5.2.1 Methodizing theory

With regard to the answering of the *"What"*-part, this phase of the project was in a certain sense less scientifically and more methodical. The theoretical concept was already developed, so following the path of deduction the next exercise would be was to demonstrate the intended claims. Reduced to the essence the inquiry was to find a way for shaping theory, or better said experimentalizing the conceptual model by developing a method to test it. The actual experimentilization of the concept was built around the three different phases the model feature. Basically the experiment had to underpin the theoretical claims of these three phases of the model. The concluding remarks to this part of the question would be that the method to prove these phases comprised in fact two tests. One for demonstrating the actual working of the mechanisms of Cultural Theory by operationalizing the framework. This would then prove the claim that a developing area can be divided into archetypes that feature a certain rationality. And a secondly a test in order to prove the claim that it is possible to reflect on rationalities by deploying strategies that fit the perceptions and perspectives that come with these rationalities.

5.2.2 Operationalizing theory

The *'How'*-part of the question regards the operationalization of the theoretical concepts the model featured. As the research project follows a quantitative research strategy, conclusions of the research will be based on figures. To extract these figures collecting data that measures the theoretical concepts is required. The challenge of collecting data here had to do with the fact that it mainly regards socially based information, because the data is obtained from individual insights and can thus vary from subject to subject. In an attempt to capture social data into figures, indicating keywords in order to measure perceptions and perspectives, and a pallet of contrasting pre-defined indicating incentives – that are tailor-made to the rationalities – have been devised. Both the indicating keywords and the contrasting pallet of pre-defined incentives have been formulated based on the storyline of literature by Schwarz & Thompson (1990). The conclusion on the *'How'*-part here is that in order to demonstrate the theoretical concept, that is the backbone of this project, social data has to be converted into measurable units. During the experiment these indicators have been used as units of measurement. Thus: *"The concepts can be been encapsulated by predefined keywords and incentives who are derived from literature"*.

5.3 Considerations on the analysis

The third and last phase of the project comprised the actual analysis of observed facts obtained by experiment. As the research project was initiated from the question: "*How to stage cooperation for implementing River Management Development measures?*", this phase of the project was exercised in order to demonstrate the concept that is expected to indeed contribute to an increasing chance to gain cooperation. The origin of that question stems from a notice that traditional acquisition strategies not always successfully result into desired outcomes. Which utterly leads to a stagnation of the planning process and thus has a negative impact on its effectiveness. So in essence the aimed result of the project is to improve on effectiveness of the planning process. This means that the analysis was manly focused on the performance of the conceptual model itself, and not on the implications of the results for the researched area. In order to assist the inquiry the research question for this phase was formulated as:

> "*To what extent is the concept capable to improve the effectiveness of the planning process of river management development?*"

This question includes thus both the experimental inquiry of this project and its implications for the planning process to the extent of its effectiveness. The empirical part of this research project was accomplished after completing the analysis on the experiment. The research strategy of the overall project was all about confirming the theoretical

expectations of that model. Theoretical knowledge served as a starting point for solving the research problem of lack of cooperation. Basically the conceptual model comprehends three phases that are in fact a small part of larger phase in the planning process. The core of becoming able to make the claim solid was about proving the concept by examining the three sub-phases whom together form the model. The experiment that gave substance to that examination comprised an application of the conceptual model into an actual river management development area. For this experiment the *Kromme Rijn* catchment area was chosen because that area that is subjected to *Water Framework Directive* 2000/60/EC (WFD) based water tasks.

5.3.1 Finings trough experiment

Testing the first phase of the model was basically about the inquiry to prove to what extent it is possible to determine standardized archetypes of actors within a planning area. Which in fact implicates a taxonomic exercise of dividing actors based on their perceptions and perspectives by the framework of Cultural Theory. The theoretically expected results of the testing included to find prove of a relation between the *types of ownership* defined by *zoning*, and the *type of rationality* defined by the *framework.* That prove was needed in order to demonstrate that *it is possible to generalize the residents of a certain catchment area to a standard set of actor archetypes*. The main findings of this test have been obtained by the result of cross table interpretations. In those cross tables the variable *actor rationality* have been opposed against the variable *land-use* – based on zoning –, for obtaining percentages of representation of *rationality type* in the *type of land use*. Although the initial expectations were to find a much wider variation of archetypes, the experiment yielded a clear pattern in representation of rationality versus land-use. This is in line with the basic assumption for this phase of the conceptual model.

Testing the second phase of the concept comprised revealing the interacting expressed ideas and feelings of the specific actor types. The idea underlying this part of the concept stems from the literature of Cultural Theory. This particular publication describes, among other things specific perceptions and perspectives that are exemplary for certain rationalities and thus can be assigned as typical to the in an earlier stage demarcated actor archetypes (*Schwarz* & *Thompson*, 1990,pp.66-67). So the exact aim for this phase was to find evidence that typical characteristics with respect to perceptions and perspectives, go along each specific actor archetype. The core of the examination results has been obtained by statistical analysis based on descriptive statistics on frequency tables. In these frequency tables the scores on either the *degree of perception* or the *degree of perspectives* where compared to the *rationalities of actors*. Additionally, this information could also be translated into the framework of Cultural Theory. By exercising these two analyses both patterns on 1) *Favored rationality indicators* and 2) *The rationality orientation* (material or value), have been disclosed. So to that extent the tests supported the claim on this phase of the concept. However certainty about found patterns unfortunately was not supported by an Analysis of Variance (ANOVA), thus found patterns, feature no certainty and risk to be based on coincidence.

The third and last phase of the model should be responsible for the actual act of gaining cooperation. The suggestion here was that administrating strategies that fits an actor's rationality increases the chance on cooperation. To find evidence on that idea the test was about finding out *to what extent archetypes exhibiting shared preferences towards certain incentives*? Input for the test was a pallet of twelve pre-defined and contrasting incentives that have been operationalized based on the storyline of literature by Schwarz & Thompson (1990). The aim of the examination of this phase was about finding *a relation between the archetype of actor, and the preference of incentive such an archetype features*. Findings of that kind mainly have been based on the results of cross table interpretations on a table in which *rationalities* have been linked to preferred *incentives*. Interpretations have been done based on patterns expressed in percentages. These patterns feature a relation between the *archetype of actor*, and their *preference of incentive* that can be deployed in order to gain cooperation for implementing river management measures. In order to assess the validity of these patterns an inductive statistical test was exercised. This test (Chi-square) did not resulted into significance, which implicates that claims drawn for this partial test on cannot remain uncritically, because observed patterns risk to be based on coincidence.

5.4 Final conclusions

Based on the answers and finding of the just elaborated analytic (sub)questions it is possible to formulate an answer to the primal question underlying this research project. This question can be decompose into a *"What"*-part which addresses the search for an approach that deals with the phenomenon within the planning process of the here researched river management development; the phenomenon that leads to the research problem of lack of cooperation. This first part of the question supported the theoretical phase of the project. The second *"How"*-part was meant to encourage the conceptualization and testing of such an approach that would able to react on this phenomenon, and thus improve the planning process towards more effectiveness. The answers on these two parts of the primal question are fully based on answers and finding found by the mentioned analytic (sub)questions in the theoretical-, methodological- and analytic phases of this project. Tied together into a synthesis two generic concluding remarks can be prepared, namely on: 1) *Giving substance to lack of cooperation*, which will be elaborated in paragraph 5.4.1, and 2) *Reacting to lack of cooperation*, which will be elaborated in paragraph 5.4.2.

5.4.1 Substance to lack of cooperation

The formulation of concluding remarks to the *"What"*-part of the question starts with the theory-based position that traditional strategies within the planning process are not sufficiently able to respond to the different beliefs and different attitudes because of their inability to respond to the different perceptions and perspectives of actors within a public work developing area. That shortcoming in the planning process ends up in lack of cooperation with, amongst other, initiated measures for river management purpose. Such lack of cooperation makes the planning processes less effective. Thus based on the first theoretical phase of this research project an answer to the question:

"What approach gives substance to lack of cooperation,…", would be: *"An consensual-approach that divide different perceptions and perspectives* and *respond to these".* The concluding remarks following that answer would be:

> *"In order to deal with lack of cooperation it is desirable to incorporate a consensual-approach that:* 1) *Is able to give taxonomically substance to the different perceptions and perspectives within the planning area, and* 2) *Is able to respond to these different process perceptions and perspectives."*

The result of the first *"What"*-part of the primal research question led to the development of the *"Prism"*-concept, which is believed to serve as such an approach.

5.4.2 Reacting to lack of cooperation

Concluding remarks on the *"How"*-part of the primal question are based on the experiment on the theoretical concept that gives rise to a consensual approach; the *"Prism"*-concept. To a certain extent the experiment demonstrated the existence of prevailing *perceptions and perspectives* within the planning area, and even more important, that these can be put apart by Cultural Theory. The experiment has also shown that these prevailing *perceptions and perspectives* come with preferences for specific incentives. Based on that knowledge the answer to the question *"…How to react to this phenomenon?"* was: *"divide the area it's prevailing perceptions and perspectives by the framework of Cultural Theory, and then respond to these unrevealed rationalities by incentives that fits these world views an cultural biases".* The concluding remarks following that answer would be:

> *"The experiment on the "Prism"-concept gave good clues that the model is capable to contribute to the planning process because of its capacity to anticipate on plurality within a developing area."*

The aimed result of this project was a claim that the *"Prism"*-concept is able to deal with the research problem. But although clues have been found that are inline with the theoretical framework, not all of the experimental results could be validated by inductive statistics. Thus that claim cannot yet be made in a valid way.

5.5 Reflection on the research project

With executing the experiment and completing the analysis the empirical part of this research project was accomplished. Although there have been results achieved who are inline with the theoretical framework, this part of the project went quite turbulent. So any reflective notes based on progressive insights are not inappropriate here. Insights with respect to, 1) *Operationalization*, 2) *Chosen method for testing Hypothesis 2 and 3*, and also with regard to 3) *Choice of the research area*, the path this research followed can not pass by uncritically. Below a discussion on these points in brief:

Ad 1) Operationalization: When translating the information from the returned postcards and the collected door-to-door forms, towards a useful dataset, already at an early stage it appeared, that within the whole population there was a disproportionate preference for the indicator *nature conservation*. This probably has led to a representation of the Rationality of Egalitarians, which was out of proportion. And also had a major impact on the research on the degree of perception and perspective. This alleged distortion of the researched reality is the result of a too generic – and therefore not distinctive – operationalization of this indicator. A probable reason for this shortcoming is a perspectival research approach, caused by too much focus on what is described by theory and too little sense at a possible interpretation in practice by interviewees who are not familiar with the theory and background of the experiment and thus have not the same connotations. The survey literally posed the question: *"If the Water Authority wants to develop a nature friendly shoreline on/along your property, what will be important for you"*. If there had been more attention to the factor of possible interpretation – and less focus to what theory prescribes – the indicator *nature conservation* would have been left out of the survey, because that specific indictor (nature conservation) is likely to have a generic association with the development of nature friendly shorelines. And turned out to be an obvious choice for the interviewees who participate in the experiment. Note that the at the beginning of the project there was indeed awareness for aspect of ecological validity (paragraph 3.2.1), however along the operationalization process a perspectival attitude due to theoretical bias probably got grip on the implementation. Advice for further research: *"Operationalization of indicators to be used in survey have to be to be tested more extensively on ecological validity by individuals who are independent from the project, and therefor reducing the risk of bias"*;

Ad 2) Chosen method for testing Hypothesis 2 and 3: Basically the idea behind hypothesis 2 and 3 was assigning specific perceptions and perspectives to the previously found archetypes. Based on the current research strategy (figure 3.2) some results have been achieved, however it may be considered whether there are methods that can generate more evident results. The lack of detail has partly to do with the fact that: a) *The archetypes could not be named in detail*, but above all b) *The information from the survey was not completely suitable for a more desirable analysis*; a factor analysis. The reason why the current strategy of *descriptive statistics* combined with a *variance analysis* (ANOVA) was chosen had to do with the design of the survey. As stated in section 3.3.2 the project had to deal with a high risk of non-respond. To overcome this risk a very simple – and thus accessible – survey design has been chosen in order to keep participating as attractive as possible. For applying a factor analysis it is however necessary to introduce a (*Likert-)scale*, which was deliberately kept out of the survey in order to keep it short and simple. In short, the non-application of a factor analysis was the result of a trade-off; accessibility of the survey in need of response versus accuracy to the extent of detailed evidence. The choice for the first option was based on the idea that

non-response would lead to no analysis at all. Advice for future research: *"The introduction of a scale into the survey is desired; a (Likert-)scale in relation to the indicators on perceptions and perspectives"*;

Ad 3) The choice of the research area: The research area was mainly selected on the accessibility of data on property (land plots) and their owners along any river catchment. Initially, it was the intention to perform the project on the catchment area's of either the river *Wupper* and the river *Lippe* in the German state of *Nordrhein-Westfalen*. However, the German *Federal Data Protection Act* (1990) prohibits institutions to provide of personal data (BDSG, 1990; EC, 1995). Personal data is defined as *"…any information concerning the personal or material circumstances of an identified or identifiable individual…"* (section 3, sub 1). So because of this privacy law it was not possible to obtain the information necessary for the experiment within any short terms. Therefore a catchment area in the immediate vicinity of the *Utrecht University* faculty of *Geosciences* was on obvious choice because of a close relationship with the prevailing water authority *Hoogheemraadschap Stichtse Rijnlanden* (HDSR). This connection made it possible to get access to the required data for creating a sample. The choice for the *Kromme Rijn* catchment was evident; 1) *Assignments of WFD-water tasks rest on the watercourse of the river Kromme Rijn*, and 2) *Measures in order to fore fill these WFD-tasks have recently (2010-2016) been implemented along this catchment*. The idea here was that interviewed actor from this development area would have a strong feeling to the extent of WFD-measures, which utterly should benefit the quality of the research. However, after performing the experiment its population appeared to be quite homogeneous with regard to zoning-types, which resulted in an under-representation of certain Land-uses. This harked back on the formation of archetypes, as these could not composed as detailed as they initially were intended – an assembly of both *zoning* and *rationality* –, so the project has not progressed beyond a division into two very generic archetypes. Which obviously has been a clear cut for the research. Advice for future research: 1) *"Selecting bigger populations"*, and 2) *"Composing a dataset based on a stratified sample"*.

Unfortunately, these findings emerged to the surface too late in the process, so that at this present moment in the trajectory it is no longer possible to adjust the course of project other than that the whole project should be started from scratch again. The latter statement is mainly due to the fact that the above mentioned points require the survey to be re-drafted and to be plotted in a whole new experiment. Given the fact that this is an exploratory research within the scope of obtaining a Master's degree (MSc. Urban and Regional Development), it seems at this point in the process no meaningful exercise to completely dismiss the project. The results are sufficiently distinctive that it can serve as an exploratory study, and based on the lessons learned further research can be are formulated. The results provide sufficient basis to further research on the impact of the mechanisms of Plurality and Cultural Theory in the implementation process of public works. And it gives *"food for thoughts"* on whether the *"Prism"*-concept indeed can fill the gap in the effectiveness on the planning processes of public works in general and river management measures in particular.

5.6 Recommendation for further research

Eventually this project has resulted into clues that an operationalization of the Cultural Theory framework indeed achieves what theoretically was predicted. Nevertheless, hard statistical evidence has not emerged for reasons discussed above. Since the project was initiated by the HKC as an exploratory research which serves as a prelude for a full scale scientific research on the development of consensual planning methods, this concluding chapter ends with a recommendation for further study in the German state of *North Rhine-Westphalia* (appendix A). Regarding water tasks arising from European legislation, an assignment relating to Directive 2007/60/EC, known as the Flood Management Directive (FMD), apply for the river catchments of that specific area. To a certain extent the project was initiated from a context of stagnation during the planning process of river management measures who are related to flood risk; the previously mentioned development of thirteen floodplains along the *Rhine* catchment area. So the continuing research with a focus on FMD-water tasks is would be a logical choice. As both the catchment areas of the *Wupper* and the *Lippe* are subjected to FMD-water tasks thus these rivers seems to be ideal objects for the continuation of this project. To support this statement this chapter continues with some small elaborations on the Directive 2007/60/EC, with regard to its measures and the spatial features of the suggested two research areas.

5.6.1 Research on FMD-directive

The *Flood Management Directive* (FMD) is arranged accordingly the WFD; it's a framework for community action in the field of water policy. In short, the Directive 2007/60/EC it's primal aim is managing the risks posed by floods to *"human health, the environment, cultural heritage and economic activity"* in all the EU member states (EU, 2007b). Substantively the directive achieves this aim by requiring the implementation of adequate flood risk measures, based on threat assessments and mapped hazard impact on assets and human life. Basically the scope of the directive is based on (international) river catchments, sometimes further merged into river basin districts. Each EU member state is required to ensure the appropriate administrative arrangements to implement the directive within its legal system. In 2009, Directive 2007/60/EC was implemented into the German Federal Water Act, who in its turn requires the individual German state to be responsible for the implementation of the directive (Johann & Leismann, 2013, p.1; BMUB, 2009, p.9; WGH 2009, §7, sub 2). The state [*Länder*] of *North Rhine-Westphalia* assigned the district authority [*Bezirksregierungen*] as the regional authorities that execute this water act. However, at the same time the water boards whose managing areas lie within the jurisdiction of those district authorities have the responsibility for water management. Thus regulating water run-off, ensuring flood run-off, and managing floodwater is the water boards legal task (Johann & Leismann, 2013, p.1).

Water quantity
The substantive aim of the Flood Management Directive is to reduce flood risk by implementing adequate and coordinated measures. Other than the for this project researched river *Kromme Rijn* both rivers *Wupper* and *Lippe* have to deal with discharge and thus flood risk. This has amongst other things to do with the fact that the origin of the *Kromme Rijn* involves an inlet construction while the rivers Wupper and Lippe start from a seepage source. So to a certain extent the discharge of the river *Kromme Rijn* is man regulated while the both the *Wupper* and *Lippe* are more subject to discharge related issues. This implicates that, additionally to WDF-appointments, both rivers additionally have been have been appointed to FMD-aims too.

Flood Management Directive
The *Flood Management Directive* (FMD) is arranged accordingly the WFD; it's a framework for community action in the field of water policy. In short, the Directive 2007/60/EC it's primal aim is managing the risks posed by floods to *"…human health and life, the environment, cultural heritage, economic activity…"* (p.1) in all the EU member states. Substantively this directive achieves this aim by requiring the implementation of adequate flood risk measures, based on threat assessments and mapped hazard impact on assets and human life. Basically the scope of the directive is based on (international) river catchments, sometimes further merged into river basin districts.

FMD-measures
Generally spoken the risk of floods in large parts of Europe is growing because in past centuries rivers in European countries have gained less space. Most European rivers are squeezed between dykes that are ever getting higher, while at the same time populations of people living behind the dykes grow either. Simultaneously, due to a variety reasons, subsidence[1] appears to happen in this land behind the dykes, leaving the surface level of the hinterlands behind the dykes to decrease in a continues way. In addition, due to climate change it rains both more often and harder, which makes European rivers to processes discharge in peak loads. And although heightening dykes and levee bodies seems an effective and thus an obvious and quick fix to the problem, yet in the long-term such measures do not provide a sustainable solution. This stems from a variety of reasons. One problem that may appear with raising dike and levee bodies is the slackness of local surface material (e.g. peat soil). Heightening up a dike at such a location will increase the ground pressure, which result in a higher risk of instability. Additionally dike elevations means bigger dimensions of the constructions it self which may have adverse effects on values like landscape, nature and cultural heritage. Rising dykes also entails increasing the height between the river and its hinterland during extremely high water.

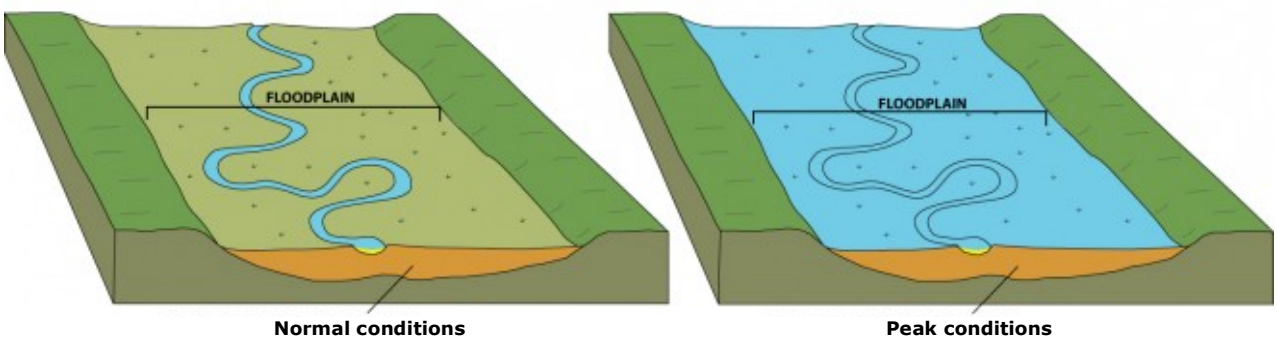

Figure 5.4. Floodplain principle

Soon a dike collapses during such a peak load of water, the hazard will be even greater than in case of a dike break in the current situation. In order to cope with both the aspects of: 1) *Less space* and 2) *Peak loads in discharge*, water levels in rivers should be reduced. This can be achieved by among other things widening the river profile at several places along its catchment; giving rivers more space so to say. This can be achieved by amongst other things, moving dyke- and levee bodies further inland or digging (reopening) water channels that can be filled up at high tide. Also decreasing surfaces of flood plains can be seen as a possibility to create more capacity to store water, as these areas can be flooded during peak loads. Soon the river gets more temporary space the pressure on dykes and levees will decrease. Planning issues related to the implementation of river management measures not only stem from the high demand for space but also from the economical and environmental implications that come with the implementation of such measures, because by widening a rivers profile the spatial features of the surrounding area will be engaged too. Such measure can have a large impact on economical activities soon these will be planned at industrial or agricultural sites. The same hold for planning measures at nature reserves or historical sites, as these may impact landscape and cultural or interfere the local ecological- of environmental systems.

5.6.2 Research in the Lippe and Wupper catchment areas
As discussed the choice of research area for this project was based on accessibility of data on property (land plots), which was a key condition for the experiment. One of the first challenges for an advanced project will undoubtedly be dealing with the German *Federal Data Protection Act* (1990) to the extent of obtaining personal data (BDSG, 1990; EC, 1995). However soon this barrier is taken these areas seems to have lots of opportunities to the extent of their spatial characteristics. Based on a quick scan both areas seem to feature a variety of landscape types. This may be an indication of a multitude of zoning-types, which is expected to result into a large representation of

different land-uses. The later increases chances on collecting information on a variety of archetypes, which utterly drags over to the quality of insights. Because one of the biggest problems the inductive statistical analysis of this project faced regarded: 1) *Homogeneity of the target population*, and 2) *Available stock of numbers of cases*. This had major implications for meeting pre-conditions that come with statistical tests like Chi-square- and ANOVA, and thus the validation of results. The suggested catchment areas cover a larger surface area, which comes with an increased chance to collect a larger scale of data, and thus have a greater potency for achieving solid conformation. This last paragraph elaborates in a quick and dirty way on the spatial characteristics of both catchment areas in order to endorsed this believed potential.

Wupper
The *Wupper* catchment measures a length of roughly 115 kilometers and its situated in the German state *of North Rhine-Westphalia*. These days the stream arises under the name Wipper in the town of Börlinghausen. The river runs with a brief sweep northern angle, called *Wupper Viereck*, from east to west. It flows through the towns and villages of Marienheide, Wipperfurth, Hückeswagen, Radevormwald, Wuppertal, Remscheid, Solingen until it meets the Rhine at the town of Leverkusen. In its current shape, the source of the stream was shaped in 1968 for the preservation and development of the habitats of endangered species (LANUV, 1968). Further downstream the river is dammed in fourteen places to protect the catchment against flooding. At the same time, the containments serves the function of lift in low-tide periods. In addition, the reservoirs serve both the production of electricity and as habitats for nature (Wuperverband, n.d.).

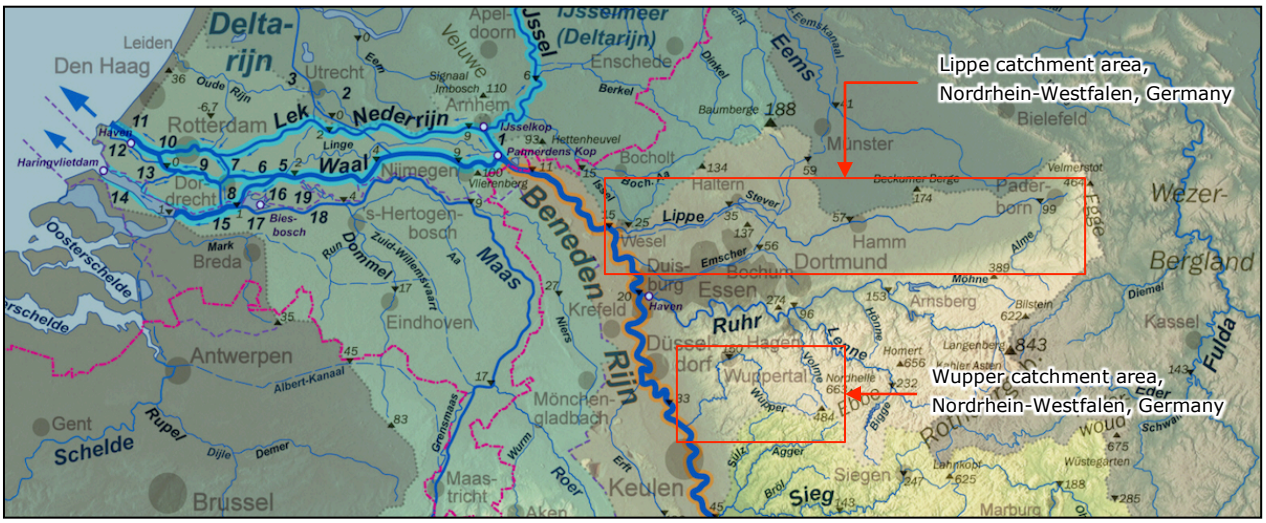

Figure 5.2. Testing areas

Spatial features along the Wupper
After the river off springs from its source area near the village of Börlinghausen it meanders in a western direction through the small villages of Marienheide, Wipperfürth and Hückeswagen. This area of the catchment features mainly forests interspersed with agricultural plots. After passing Hückeswagen the river widens itself into the so-called Wuppertalsperre, which actually serves as a water reservoir for both hydropower generation and flood protection. As the river continues on towards the city of Wuppertal it flows trough an area that features woods and small villages like Keilbeck and Byenburg. Within the agglomeration of the city of Wuppertal, riverbanks feature urbanized and industrialized areas, but once the steam passed the water treatment plant of Buchenhofen, the shoreline again consists mainly forests. This landscape type goes on until the town of Leichlingen. In the Leichlingen-Leverkusenin area the river meets mostly small-scale agricultural land. After passing the town of Leverkusenin the river flows into the Rhine (FluGGS, 2000). The spatial characteristics of the *Wupper* catchment area are thus likely to deliver a more heterogeneous research population then those of the Kromme Rijn, because the area is longer and more varied to the extend of land-use.

Lippe
The catchment area of the river Lippe is, like the Wupper a tributary of the Rhine. This river measures a total length of 220 kilometers. During the reign of the Roman Empire the stream was used for the transport of supplies to Roman camps, which were located along the shore. In these times, the river was a gateway to Germania. At that time the border of the empire ran here from the Rhine to Paderborn. Another historical fact but of more recent times is relating to the coalmine history of the area during the middle of the 19th century. Although the areas coalmine development stared at the Emscher area, soon it grew towards Lippe river catchment. As a result of this, problems with regard to both land subsidence and the discharge of polluted water, already started to appear in the 1860s. These days the river marks into two distinctive parts, divided by the city of Hamm. The part located upstream of this city features a more rural character; while downstream the area is characterized by settlements and industrialization. The source of the catchment is located at the town of Bad Lippspringe at the West of the Teutoburg Forest; a village just north of Paderborn. Both the streams of the rivers Pader and Alme mouths on the Lippe, just

beyond Paderborn, near the Schloss Neuhaus district. The river continues its way westward through the towns of Lippstadt, Hamm, Lünen Marl and Hünxe (Ruhr-Guide, n.d; ELGV, n.d.; LWL, n.d.).

Spatial features along the Lippe
Starting at its source in Bad Lippspringe, the river Lippe flows almost immediately – after passing the urban area of this village – runs through an area of forest, nature and small-scaled agricultural land. The industrial- and urban area of the city of Paderborn follows up that rural landscape. After Paderborn the river meanders through a lake area that among other things includes the Lippesee; which is a reservoir of the Thune. Then the river flows right through the village of Boke, and continues its way through a small-scaled agricultural area towards Lippestad. At this town, the river flows through an urban area. Leaving Lippestad the stream again runs trough an agricultural area but this time its shores will be bordered by bushes, occasionally one will meet settlements here. In the middle of this area the river flows right through the village Hovestad, and the industrial area of Lippborg. The follow-up route of the Lippe runs right past the Datteln-Hamm canal and along the city of Hamm. This area includes amongst other things the industrial *Power AG*, owned by the *Rheinisch-Westfälisches Elektrizitätswerk* – which is situated on the outskirts of the town of Werne – and the urbanized area of the town of Lünen. The stream continues its path through an alternated area of grasslands and woods and along to the industrial area of Lippholthausen. After Lippholthausen the river flows passes mainly agricultural land on to the villages of Halteren an See and Dorsten. It is this part of the route where the Lippe flows under the Dortmund-Ems Canal and the historic site of the *Kanalbrücke Alte Fahrt*. In the urban core of both Halteren an See, and Dorsten, the river flows along both residential and industrial areas. After Dorsten the river continues meandering its way again through an area of mainly agricultural grassland with groves and settlements. Where after the river finally reaches the city of Wessel, at this point the catchment ends up in a small delta that flows into the Rhine (Kreis Lippe, 2016). For the same reasons as with the *Wupper* the research population along the *Lippe* catchment area is expected to be more heterogeneous compared to the *Kromme Rijn*.

5.7 Resume

This resuming overview on the process of this project starts with the overall aim of the research. This overall aim was to contribute to the effectiveness of river management planning process by developing a consensual approach that is able to deal with a dominant issue that challenges its preference to the extent of time overruns. The here referred issue can be contained as: *"The lack of cooperation for the realization of measures by the involved actors, during the planning process of river management"*, or in short terms *"Lack of Cooperation"*. To arrive at this aim a deductive research strategy was chosen. Such a strategy follows a path of theorizing both the problem and the possible approach to tackle that problem, where after the claims that are results of this theoretical phase needs to be proved by figures. It was believed that these figures could be extracted by an experiment that tests the theoretical approach in reality. Which comes down to the application of the concept in a real life situation of a river management developing area. In order to shape a solid experiment theory was structured correspondingly the Euclides-model. This model structured the operationalization of the experimental setup for obtaining observations that could be translated into the desired figures. The baseline of that Euclides-model was built around the three key assumptions: 1) *A dominant factor in the time overrunning problem of river management development is caused by opposition* (the research problem of *lack of cooperation*); 2) *A consensual approach will be an improvement for the effectiveness of the planning process of these projects* (a direct link to the research aim of *improving on effectiveness*); and 3) *Communication* (appropriate *incentives*) *can increase the chance this needed consensus*. The theoretical phase of the project resulted into an approach that was conceptualized by a model. This concept involves in fact an operationalization of theory merged into a model. The resulting conceptual model was named *"Prism"*-concept and was shaped after another concept from natural science that has a resembling mechanism. In accordance with the chosen strategy the next Experimental-phase of the project involved testing the concept in order to prove the theoretical claims. In essence these claims comprised, two statements, namely: 1) *The mechanisms of Cultural Theory have a great impact on the effectiveness of River Management Development-planning*, and that 2) *An appropriate communication(strategies) can contribute to increase this effectiveness*. Both are bold statements, which needed to be established. The intention of the experiment was to demonstrate: 1) *A planning area is subjected to the mechanisms of Cultural Theory*, and 2) *Respond corresponding to this phenomenon, the chance on cooperation will increase*. And thus will be an improvement on the effectiveness of the planning process. The final analytical phase of the project concerned the analysis of the results out of the experiment in order to evaluate the performance of the concept. This research approach resulted into outcomes that to a certain extent indeed may contribute to the effectiveness of river management planning process, however the actual experiment turned out not to be mature yet. The experimental method needs to be improved to the extent of operationalization and also needs to be implemented in a more varied research environment. Thus the overall concluding remarks based on this research project are: *"There are clues found that the course set here is promising, although before arrive at a solid claim, further research based on progressive insights arising from this project is needed."*

Notes
1 Subsidence: The physical phenomenon that the ground level drops with the years. This phenomenon occurs in different places around the world but may have several causes. In the West of the Netherlands, subsidence appears due to peat oxidation as a result of drainage, while subsidence in *North Rhine-Westphalia* (Germany), mainly takes place due to former mining operations. The extraction of coal from the bottom creates cavities that can collapse due to vertical earth pressure of overlying strata. This may cause subsidence at the surface;

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Appx.A Assignment by the HKC

HKC Hochwasser Kompetenz Centrum e.V.

Projekte und Initiativen

>>> Projektsteckbrief <<<

Akzeptanz für Auenlandschaften als Retentionsräume

Methoden zum gesellschaftliche Diskurs & zur Partizipation

Projektsprecher:
Georg Johann, (Emschergenossenschaft & Lippeverband) &
Dr. Thomas Hartmann (Universität Utrecht)

Projektanlass

Retentionsräume dienen dazu, die schadhaften Folgen von Hochwasser zu mindern. Schon vor den letzten großen Hochwasserereignissen im Süden und Osten Deutschlands 2013 sind Projekte zur Schaffung von Retentionsräumen initiiert worden. Jedoch gerade im Zuge der Hochwasserereignisse 2013 fasste ein ARD Brennpunkt am 11.6. die folgenden drei Punkte als wichtige Lektionen zusammen:

1. Es müssen mehr Flächen für Hochwasserretention – auch extremer Hochwasser –bereitgestellt werden;
2. Das „Kompetenzwirrwarr" der Behörden im Hochwasserschutz verursacht sehr lange Verfahrensdauern von Projekten;
3. Bürgerinitiativen (und Umweltschutz) blockieren häufig Hochwassermaßnahmen.

Diese drei Punkte fassen die gegenwärtige Situation zu „den Flüssen mehr Raum geben" gut zusammen.

Problem und Fragestellung

Obwohl diese Maßnahmen für die Allgemeinheit notwendig und in hohem Maße wünschenswert sind, erzeugen sie bei den Betroffenen häufig eine Abwehrhaltung, die auch durch Flächentausch und Entschädigung nur schwer aufzuheben ist. Dies machte die Umsetzung solcher Projekte in der Vergangenheit und heute noch schwer (Beispiel: Von den von der IKSR 1998 identifizierten und bis 2020 zu realisierenden 13 Retentionsräumen sind gerade 3 umgesetzt – BUND: „Stillstand am Rhein – Naturnaher Hochwasserrückhalt am Rhein kommt nicht voran - ...").

Der Schluss liegt nahe, dass es in der Vergangenheit oft an rechtzeitiger und umfassender Partizipation mangelte, um die betroffenen Bürger und Unternehmen zu überzeugen und zu Mitstreitern zu machen. Gleichzeitig fehlen auch in der Raumplanung Instrumente, um die Schaffung von Retentionsräumen effizient umzusetzen.

Mehr Informationen unter www.hkc-koeln.de

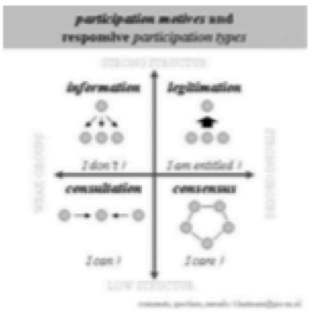
HKC Hochwasser Kompetenz Centrum e.V.

Projekte und Initiativen

Unter diesen Voraussetzungen stellt sich die Frage, welche Möglichkeiten sich anbieten, um den Flüssen mehr Raum zu geben. Hierfür bedarf es neben bodenpolitischen Instrumenten und guter Abstimmung der Behörden insbesondere einer guten Partizipation, die letztendlich auch einen gesellschaftlichen Diskurs zu akzeptablen Risiken initiieren kann.

Suche nach Lösungswegen

Eine Voraussetzung für einen möglichen Lösungsweg ist ein Kommunikationskonzept, das Bodeneigentümer, lokale Wirtschaft und Landwirtschaft mit einbindet und eine Planung, die eine konkrete Aufwertung der teilnehmenden Regionen zum Ziel hat.



In dem Projekt soll ein theoretisches Konzept in der Praxis erprobt werden. Das Konzept basiert auf dem Ansatz, dass es vier Arten von Motiven gibt, um Partizipation durchzuführen und ebenso vier unterschiedliche Motive bei Bürgern um an Partizipationsprozessen teilzunehmen. Eine nachhaltige Partizipationsstrategie muss diese vier Typen kennen und mit entsprechenden Methoden darauf reagieren. In dem Projekt wird dieser Ansatz auf den Bereich „Hochwasserretention" übertragen und passende Methoden entwickelt und erprobt.

Denkbar wäre ein roter Faden „Auenlandschaft" das über die sektorale Sicht von Hochwasserschutz und Naturschutz hinaus weitere wichtige gesellschaftlich relevante Bedürfnisse einbindet. Es soll dargestellt werden, dass ein direktes Zusammenwirken von Hochwasserschutz/Naturschutz-, Fremdenverkehrs- und Wirtschaftsverbänden der Regionen möglich und sinnvoll ist.

Das Projekt folgt der Vision die „Auenlandschaft" zu einem Qualitätszeichen auf verschiedenen Gebieten zu etablieren und dadurch nachvollziehbar für die Betroffenen und unterstützenswert über politische und regionale Grenzen hinaus zu machen.

Nächste Schritte

Zur Durchführung des Projektes wird angestrebt Mittel einzuwerben um

1. Vorstudie mit Case Study zum Erproben von Methoden an der Lippe durch Masterstudenten/ studentische Hilfskraft.
2. Teilnahme an wiss. Kongress zur Diskussion und Verbreitung der Ideen im internationalen Kontext.
3. Einwerbung von Mitteln für eine wiss. Studie zur Weiterentwicklung der Methoden in Kooperation zwischen EGLV, Universität Utrecht und HKC.

Mehr Informationen unter www.hkc-koeln.de

Appx.B The Report Kromme Rijn Experiment:
Analyzing the Survey results
Conducted in: November - December 2016
Analyzed in: January 2017

Notification The transcript below is an exact copy of the report written during the analysis of the result of the experimental phase of this research project. Large parts of the text are merged into the 3rd paper/chapter 4. This document has been added mainly because of the raw SPSS-output tables that should depict a more detailed insight into the analysis, and how the claims came about.

Survey
The entire analysis of this research project is done based on information drawn from *DATASET Kromme Rijn 50m 31 december 2016* (218 cases); a data set which was obtained from a survey conducted along the Kromme Rijn catchment area in November until December 2016. The exact data was obtained by means of either: a) *Sent postcards*, as described in paragraph 3.3.2, or b) *Door-to-door surveys* on the basis of a form that featured the same design as the postcard. Initially the idea was to collect the whole dataset by postcard survey, however the response rate was not sufficient to have the valid numbers that would apply to the population. The total population of the owners in a width of 50m either side of the catchment of the river Kromme Rijn concerned 458 cases at the time the sample was drawn (September 17th, 2016). In order to obtain a valid set of data, a response rate of at least 210[1] correctly completed survey forms was needed. The response rate from the initial postcard survey was 77 pieces, which was obviously not sufficient to serve as a valid dataset. To supplement the shortfall in numbers a Door-to-door approach survey was executed in December 2016 amongst the actors in the target population who did not responded to the postcard survey. Governmental institutions, such as municipalities and the province of Utrecht, have been approached by telephone. This personal method of data extraction proved much to be more effective.

Testing Hypothesis 1
Partial test (1) examines: *A statistical correlation between the type of owner of land along the river Kromme Rijn, and the type of rationality represented by this owner regarding the implementation of nature friendly shorelines*. In this research the (cases) owner type refers to actors who are using their property in accordance with the legally established land-use for their property, and serve as object data. Such legal establishment is better known under the term *"Zoning"* (chapter 3.2). The proviso here was that these owners have this property in a range of 50 meters from the shoreline of the river Kromme Rijn. The information about land-use was obtained through the website www.ruimtelijkeplannen.nl. The type of rationality was determined based on the theoretical framework in section 2.4 of this bundle (pp.20-23). For each case, the rationality was drawn on the basis of domination in preferred indicators in one of the four quadrants of the Cultural Theory framework (figure 2.1). Data with respect to this preference where distilled from the target population by survey in a manner as described in section 3.3. The whole exercise is done in order to demonstrate Hypothesis 1. This hypothesis is formulated: *"It's possible to classify types of actors (archetypes) based on the functions or land-uses of their plots, and generalize specific rationalities towards these archetypes"*. This assumption supports researching the query: *To what extent it is possible to generalize the residents of a certain catchment area to a standard set of archetypes*. In order to establish a foundation, the initial aim was to prove the hypothesis based on a frequency table in which rationality data would be confronted to object data. So the idea was to demonstrated hypothesis (1) likewise the arrangement described in the research design (figure 3.1). This would result in a crosstab such as table B.1. In this table (B.1) links all the land-uses occurring in this population to the four theoretical rationalities of Cultural Theory. The philosophy behind that particular exercise was to expose patterns of dominant common combinations of land-use and rationalities. Such compositions are, in this study, referred to as archetypes; *"Agricultural Individualists"*, *"Hierarch Municipalities"*, "Egalitarian Nature preservation organizations" or *"Fatalistic Residents"* could be examples of this. A quick glance at the presented table (B.1) instantly gives the insight that the dataset obtained from the *Kromme Rijn* has not enough information to make valid judgments. In order to investigate whether or not there is a statistical correlation between the two categorical variables land-use and rationality a Chi-square test should be performed. However, the presuppositions for preforming a Chi-square test (Cochran rule[2]) are: 1) *All expected cell frequencies are greater than or equal to 1*, and 2) *Up to 20% of the expected cell frequencies lie between 1 and 5*. The below presented frequency table B.1. does not meet these demands. Basically this means that in such a configuration, it is impossible to apply a statistical Chi-square test in order to test the significance and strength of a possible correlation. Merging categories in one of the two variables, therefore, was a necessary exercise. Given the prominent role of Cultural Theory in the conceptual model, the merging of rationalities was not an option. So in that sense, merging categories of zoning was the obvious choice. The merging exercise of zoning has been iterated until the rule of Cochran was met. The need to assemble data together was a disappointing but necessary operation because it enables the continuation of further analysis. The remaining categories of *"Residential"* and *"Non-residential"* are lean yet distinctive enough to find a correlation between the type of owner and the type of rationality. Especially because the project has been set up as an exploratory research for testing the concept the exercise can be defended.

Statistical test and interpretation

For executing this partial test (1) the research strategy opted for a Chi-square test (X^2). Because this particular test would examine whether there is a statistically significant association between the two categorical variables 1) *Rationality*, and 2) *Archetype land-use* (Residential use of Public/Commercial use). The cell frequencies in the cross table, are the observed frequencies of dominance of choice to the extent of rationalities by *"Owners of land plots-which lie in a range of 50 meters from the shoreline of the river Kromme Rijn"* (chapter 3.3). These frequencies are measured in December 2016, by means of survey. The Chi-square test will analyze the observed cell frequencies of the cross table, by comparing them with the expected cell frequencies. If there is no difference, the observed cell frequencies are based on coincidence, which implicates that there is no connection. If there is a significant difference between observed and expected cell frequencies, one can speak of a connection. This implicates that the rationality categories differ significantly from each other.

Table B.1. Cross table; Zoning vs. rationalities

	Rationalities									
	Fatalistic		Hierarchic		Egalitarian		Individualistic		**Total**	
Land-use	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*
(based on zoning)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Dwelling	*28*	*15%*	*25*	*14%*	*97*	*53%*	*34*	*18%*	*184*	*100%*
Mixed use	*1*	*20%*	*0*	*-*	*2*	*40%*	*2*	*40%*	*5*	*100%*
Business	*1*	*20%*	*3*	*60%*	*0*	*-*	*1*	*20%*	*5*	*100%*
Traffic	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*	*1*	*100%*
Water	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*	*1*	*100%*
Recreation	*0*	*-*	*0*	*-*	*2*	*100%*	*0*	*-*	*2*	*100%*
Forrest	*0*	*-*	*1*	*100%*	*0*	*-*	*0*	*-*	*1*	*100%*
Nature	*1*	*100%*	*0*	*-*	*0*	*-*	*0*	*-*	*1*	*100%*
Agriculture	*8*	*57%*	*3*	*21%*	*1*	*7%*	*2*	*15%*	*14*	*100%*
Agriculture with Natural value	*1*	*25%*	*1*	*25%*	*2*	*50%*	*0*	*-*	*4*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Data adjustment

To be able to preform a Chi-square test two necessary adjustments had to be made to the raw data of *DATASET Kromme Rijn 50m 31 december 2016*. These adjustments are: 1) *Perceptions and perspectives distilled from the survey data have been merged into one of the four rationalities of Cultural Theory*. The choice of rationality was done based on dominant presences, of the selected perceptions and perspectives, in a particular quadrant of the framework (figure 2.1). And 2) *Zonings have been bundled into larger, more generic, land-use types*. The results are presented in table B.2.

Table B.2. Cross table; Land-use vs. rationalities

	Rationalities									
	Fatalistic		Hierarchic		Egalitarian		Individualistic		**Total**	
Land-use	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*	Cases	*Ratio*
(based on zoning)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Residential use[1)]	*29*	*16%*	*25*	*14%*	*96*	*52%*	*34*	*19%*	*184*	*100%*
Non-residential use[2)]	*11*	*32%*	*8*	*24%*	*8*	*24%*	*7*	*21%*	*34*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

1)Includes all the plots within the dataset where a Dwelling use is granted by an institutional zoning plan;
2)Includes all the plots within the dataset which have a Agricultural, Agricultural with natural value, Mixed, Forrest, Water, Commercial, traffic, Nature or other Public use is granted by the current institutional zoning plan;

Based on the basis for the Chi-square test applying rule of Cochran, it was necessary to bundle the specific zonings information, obtained from surveys, into a more generic variable relating to the type of land-use. The bundling exercise concerned the categories: a) *Agricultural* b) *Agriculture with Nature values*, c) *Mixed use*, d) *Forrest*, e) *Water*, f) *Commercial use*, g) *Traffic*, h) *Nature*, and i) *Recreation*. These categories have been combined into one larger overarching category called *Public-/Commercial land-use*. Compared to the original subdivision, only two archetypes remain: A) *Residential land-use*, which is entirely based on the zoning of dwelling, and B) *Public-/Commercial land-use*, based on the just described bundle. This exercise can be considered as a clear-cutting with regard to details of the research results, however the limited presence of the above-listed zoning categories in the available dataset leave no other choice, then the reduction into two archetypes. In addition, these two categories are distinctive enough to show that there is a correlation between an archetype in land-use and rationality, which was initially the aim of the test.

Statistical conclusions test Hypothesis 1

In order to execute a Chi-square test in the statistical program SPSS the first exercise was to draft a cross table in which the categorical variables of land-use and rationality are confronted towards each other. The above presented cross table (table B.2) contains both absolute frequencies (N), as these where measured by survey, and relative frequencies who are expressed in percentages (%) of the share of the considered variable; in this partial test (1) rationality. On the basis of percentages in cross table B.2 interpretations regarding the influence of the variable land-use on the variable actor rationality, have been made. Or better said, whether actors in one of the two archetypes of land use exhibit a greater representation in one of the quadrants of the Cultural Theory framework. Within the for this research project considered catchment area of the Kromme Rijn, the landowners of plots who feature a Public-/Commercial land-use seem to have a much higher percentage of representation in the category Fatalstic actors (32.4%) compared to the remaining categories. These all stay around the 20% (resp. Hierachic actors 23.5%, 23.5% and Egalitarian actor Individualistic factor 20.6%). In the land-use category of only Dwelling the is Egalitarians are clearly the most common rationality type (52.2%). The remaining 47.8% is almost equally divided amongst the to the rest of the categories (resp. Fatalistic actors 15.8%, 13.6% and Individualistic Hierachic actor 18.5%). The assessment of this partial test was conducted to demonstrate whether or not there is a statistical relation between the use of land-plots along the Kromme Rijn river catchment and rationalities of the owners. To serve this aim, the following null hypothesis was formulated:

- H_0: *Observed frequencies = expected frequencies*. There is no statistical relation between the *Observed frequencies* and the *expected frequencies* in *land-use*;
- H_A: *Observed frequencies ≠ expected frequencies*. There is a statistical relation between the *Observed frequencies* and the *expected frequencies* in *land-use*.

Note a. beneath the table of the Chi-square test for hypothesis 1 (figure B.2) indicates that 0% of the expected cell frequencies is less than 5, and that the smallest expected value is 5.15. And thus complies with the rule of Cochran. The Pearson Chi-Square is 11.2. The associated probability of exceedance is Asymp. Sig.=0,011, with a degree of freedom df=3. The exceedance probability is smaller than the confidence interval 0.05 which means that the null hypothesis is rejected; there is a statistical relation between the *Observed frequencies* and the *expected frequencies* in *land-use*.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11,183[a]	3	,011
Likelihood Ratio	11,258	3	,010
Linear-by-Linear Association	4,984	1	,026
N of Valid Cases	218		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 5,15.

Figure B.2. SPSS output: Chi-square test for hypothesis 1

Concluding remarks on test Hypothesis 1

Based on a Chi-square test conducted in SPSS, the claim drawn for this sub-investigation on hypothesis 1 was that there is a significant relationship, $X^2(3)=11,2$; $p<0,05$, between land-use and rationalities of land owners who have property along the catchment of the river Kromme Rijn. Cross table B.2 shows that landowners of property that features a Public-/Commercial land-use have a bigger representation in the Fatalist quadrant of the Cultural Theory framework. On the other hand, landowners with property with a Residential type of land-use, features more dominantly an Egalitarian rationality.

Testing Hypothesis 2

Partial test 2 examines: *To what extent certain archetypes base their rationalities on perceptions, and which specific perception is typical for such an archetype*. An important input variable for this test is the in test (1) obtained archetype of actor. A categorical variable based on two categories; *Residential land-use* and *Public-/Commercial land-use*. For practical reasons the terms Residential land-use and Public-/Commercial land-use have been changed into respectively *'Residential'* and *'Non-residential'*. Test 2 is done in order to demonstrate the Hypothesis: *"In a certain sense, one can assign specific perceptions to the previously established archetypes"*. This hypothesis was formulated around the research question: *Assumed that the population can be generalized to archetypes, which*

perception goes with each archetype. To get a global first picture on this statement the first exercise was to create a frequency table in which the in paragraph 3.4.1 (p.37) operationalized perceptions would be confronted to the in test 1 composed archetypes. This resulted into the below presented *table B.3.*

Table B.3. Perceptions; Percentage (%) within the archetypes

Perceptions	% of pop.	Archetype: *Residential* F[1)]-actor	H[2)]-actor	E[3)]-actor	I[4)]-actor	*Non-residential use* F[5)]-actor	H[6)]-actor	E[7)]-actor	I[8)]-actor
Expertise	*13%*	-	*52%*	*13%*	*3%*	-	-	*29%*	*14%*
Rules	*11%*	*7%*	*28%*	*6%*	*9%*	-	*50%*	*14%*	*14%*
Strategy	*11%*	*3%*	*36%*	*8%*	*6%*	-	*25%*	*14%*	-
Control	*10%*	*10%*	*36%*	*7%*	-	-	*38%*	-	-
Safety-programs	*9%*	-	*44%*	*5%*	*3%*	-	*13%*	-	*14%*
Nature conservation	*62%*	*21%*	*52%*	*89%*	*44%*	*27%*	*38%*	*86%*	*71%*
Social-spirited	*4%*	-	*4%*	*7%*	*3%*	-	-	-	-
Support	*7%*	-	*4%*	*12%*	*3%*	-	-	*14%*	-
Preservation	*31%*	*14%*	*24%*	*52%*	*15%*	-	-	*29%*	-
Prevention	*3%*	-	*8%*	*3%*	-	*9%*	-	-	*14%*
Progress	*27%*	*3%*	*20%*	*23%*	*68%*	-	*13%*	*43%*	*57%*
Opportunity	*17%*	*3%*	*20%*	*10%*	*44%*	-	*13%*	*14%*	*43%*
Commercial	*3%*	*3%*	*4%*	*1%*	*9%*	-	-	-	-
Improvement	*5%*	-	*4%*	*2%*	*18%*	-	-	-	*14%*
Technical solutions	*29%*	*7%*	*16%*	*10%*	*12%*	*9%*	-	*14%*	*29%*
Unfair	*5%*	*17%*	*4%*	-	*3%*	*27%*	-	-	-
Locked out	*5%*	*21%*	*4%*	*1%*	-	*27%*	-	-	-
Unheard	*7%*	*14%*	-	*1%*	*3%*	*73%*	-	-	-
Uninformed	*9%*	*41%*	*8%*	*2%*	-	*36%*	-	-	-
Undergo	*4%*	*13%*	*4%*	*3%*	*3%*	-	-	-	-

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Archetypes of actors: 1) Fatalistic residential actor; 2) Hieratic residential actor; 3) Egalitarian residential actor; 4) Individualistic residential actor; 5) Fatalistic non-residential actor; 6) Hieratic non-residential actor; 7) Egalitarian non-residential actor, and 8) Individualistic non-residential actor.

Even though certain patterns can be recognized from this table (B.3), it does not sufficiently proves a relation between operationalized perceptions and archetypes of actors, because differences between these groups can be based on coincidence. This implicates that in order to get more certainty about found patterns one have to perform an Analysis of Variance (ANOVA) to test whether group means of perceptions differ from each other or not.

Data adjustment

Based on the available dataset it was not possible to perform an ANOVA-test, because the by survey retrieved data were not sufficient in a sense that data regarding perceptions where not available in an interval/ratio scale. So the raw data of *DATASET Kromme Rijn 50m 31 december 2016* needed to be transformed into such a scale. This turned out to be a simple counting exercise. For each case the by survey chosen perceptions were counted into: 1) *The number of chosen perceptions in the dominant quadrant of the Cultural Theory framework* (degree of perception in rationality), and 2) *The total count of chosen perceptions* (degree of perception in total). This exercise resulted into measurable variables on perception.

Descriptive statistics

The first exercise in this partial test (2) was a statistical analysis using descriptive statistics. The scores for the *degree of perception in general* versus the *rationalities* of *two archetypes* where compared. This was done, amongst other things based on the arithmetic mean, median and standard deviation. The results of this analysis are presented in *figure B.3* below. The results of this analysis are interpreted in the following way: Both archetypes, – *Residential* and *Non-residential* – contain the four rationalities, *Fatalistic*, Hierarchic, *Egalitarian* and *Individualistic*, so the actual analysis compared the two archetypes based on their four rationalities. Within the residential category of archetype, the rationalities featured respectively the following means scores (completed): Fatalistic residential actors (2), Hierarchic residential actors (4), Egalitarian residential actors (3) and Individualistic residential actors

(2). The Non-residential category of archetype featured: Fatalistic non-residential actors (2), Hierarchic non-residential actors (3), Egalitarian non-residential actors (3) and the Individualistic non-residential actors (2).

Report

Perception

Archetype	N	Mean	Median	Std. Deviation	Minimum	Maximum
Fatalistic residential	29	1,90	2,00	1,655	No perception	7
Hierarchic residential	25	3,72	4,00	2,337	No perception	8
Egalitarian residential	96	2,59	2,00	1,433	No perception	6
Individualistic residential	34	2,47	2,00	1,727	No perception	7
Fatalistic non-residential	11	2,09	2,00	1,700	No perception	6
Hierarchic non-residential	8	2,63	2,00	2,264	No perception	7
Egalitarian non-residential	8	2,75	2,00	1,982	1	6
Individualistic non-residential	7	2,43	2,00	2,225	No perception	6
Total	218	2,59	2,00	1,761	No perception	8

Figure B.3. SPSS output: Statistical sizes of partial test 2

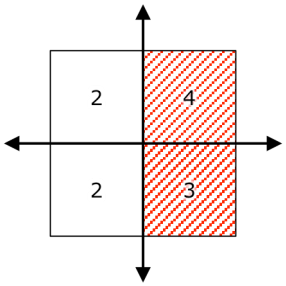


Figure B.4a.
Mean scores on the degree of perceptions in the category Residentials

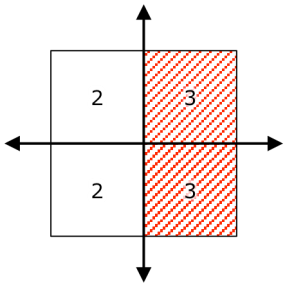


Figure B.4b.
Mean scores on the degree of perceptions in the category Non-Residentials

Figure B.3 has been interpreted the following way: In reach of the Kromme Rijn catchment the distribution of rationalities within the two archetypes is almost equal. In this distribution the rationality of the Hierarchical and the Egalitarian actors is, with the scores of 3 or more, to a higher extent based on perceptions than Fatalist or Individualistic actors. Who both have the lower mean of 2. It can be concluded that the more group-oriented rationalities (Hierarchism and Egalitarians) base their worldviews and cultural biases for a larger share on how one sees or understands.

Descriptives

Archetype			Statistic	Std. Error
Perceptions (total)	Fatalistic residential	Interquartile Range	2	
	Hierarchic residential	Interquartile Range	4	
	Egalitarian residential	Interquartile Range	3	
	Individualistic residential	Interquartile Range	3	
	Fatalistic non-residential	Interquartile Range	2	
	Hierarchic non-residential	Interquartile Range	3	
	Egalitarian non-residential	Interquartile Range	4	
	Individualistic non-residential	Interquartile Range	4	

Figure B.4. SPSS output: Descriptive table test 2 (clipped version)

The range of scores for degree of perception that archetypes feature varies greatly by the rationality. With the proviso that within the reach of almost all rationalities – except for the Egalitarian non-residentials – there are always cases whose rationality is not intellectually based on perceptions (figure B.3). The results of the survey indicates that the interquartilerange (IQR) for the different rationalities by the archetype are as follows: Fatalistic residential actors (2) Hierarchic residential actors (4) Egalitarian residential actors (3) Individualistic residential actors (3), Fatalistic non-residential actors (2), Hierarchic non-residential actors (3), and non-residential Egalitarian actors (4) and non-residential Individualistic actors (4). That is, so to say that the range of the 50% median scores for the degree of perception on a scale of 0-10, for witch each group differ from each other (figure B.4). Strikingly the Fatatalistic actors of both the Residential and Non-residential archetype exhibit a higher concentration of scores around the median (2) than the other rationalities (3-4). It can be concluded that both Hierarchical-, Egalitarian- as Individual actors, in both archetypes are, as regards the structure of their rationality, more divided on the degree of perception relative to the Fatalist actors. The next exercise was to perform the actual ANOVA test by SPSS. This was done based on: 1) *The nominal variable archetypes*, and 2) *The ratio variable perceptions (total)*. The aim was to tested to what extent the mean of the compared groups, of rationality within a archetype, are equal to each other. The results of this test are presented in figure B.6.

Statistical test Hypothesis 2

Prior to the actual ANOVA test, the first exercise that had to be done was to check on the presuppositions for preforming such a variance analysis. Because not all groups are equally in size the assumption on homogeneity could not be made. For this reason a *Levene test* have been performed in the program SPSS (figure B.5a). The output of this test showed that group variances of the dataset did indeed differ significantly (Sig.<0,05); the null hypothesis of equal group variance had to be rejected.

Test of Homogeneity of Variances

Perception (total)

Levene Statistic	df1	df2	Sig.
2,527	7	210	,016

Figure B.5a. SPSS output: Levene test for hypothesis 2

In that sense the dataset did not meet the condition of homogeneity, so a variance analysis, which corrects for the differing group variance had to be done. For conducting such a test in SPSS, one can choose either the *Brown-Forsythe* test or the *Welsh* test. Both methods can be used in order to calculate alternative F-ratios in case there is a significant difference between group variances. As a result of the just executed Levene's test a significant difference was indicated so there is a big difference between the group sizes. The ordinary ANOVA F-ratio will be too conservative in such a case. The applicable alternative ratios by Brows-Forsythe and Welch try to mitigate the influence of the variance of large groups. Based on a preference of the statistics teacher of Utrecht University the choice for this research project was a *Welsh* test (Vocht, 2013, p.174). Results of this test led to a significant result (Sig.>0,05). The SPSS output of this test is presented in the figure B.5b below.

Robust Tests of Equality of Means

Perception (total)

	Statistic[a]	df1	df2	Sig.
Welch	1,512	7	34,205	,196

a. Asymptotically F distributed.

Figure B.5b. SPSS output: Welch test for hypothesis 2

The on the below presented ANOVA table of output (table B.6) contains successively: *Sum of squares*, *degrees of freedom* (df), the *Mean squares* (variance) and the statistic with exceedance probability. The variance is calculated by the squared deviations of all observations of *total count of chosen perceptions by each case*, relative to the mean, divided by the degrees of freedom (7). The F-value is the quotient of the calculated in between- and inner variances. As the proportion of explained variance is greater the F-value will be greater as well, which implicates the differences between the groups become larger, and will lead to the rejection of the null hypothesis.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Perception * Archetype	Between Groups	(Combined)	49,489	7	7,070	2,382	,023
	Within Groups		623,355	210	2,968		
	Total		672,844	217			

Figure B.6. SPSS output: ANOVA test for hypothesis 2

As the assessment of this partial test aimed to demonstrate that the population means of all groups of rationales within both archetypes, are equal to each other. To serve this aim, the following null hypothesis was formulated:

- H_0: ($\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6=\mu_7=\mu_8$) Population means of all eight groups are equal. Soon groups are equal one may expect the mean population values will not vary and will lay relatively close to the overall population mean;
- H_A: Population means of all eight groups are not equal; soon H_0 is rejected at least one of the means of the group differs.

The test statistic F=2,4 has a significance of less than 0,05. This means that with 95% confidence, the null hypothesis, *that all the eight groups are equal to each other*, is rejected. This means that to the extent of *total count of chosen perceptions* the eight groups vary significantly from each other. On the basis of the analysis of variance the conclusions are drawn that the null hypothesis could be rejected; the mean degree of perception in total of the eight groups are not equal to each other. This does not mean that they all eight real differences. To find out which groups exactly differs; a Tukey's test was preformed in SPSS. The result of this test is presented in figures B.7 next page. Figures B.7 shows the output table of the Tukey's test. The figure (B.7) contains all the compared pairs of rationalities of the two different archetypes. The significances that are marked with an asterisk (*) indicate that only the *degree of perception in total* of the *Fatalist residential actors* and *Hierarchic residential actors* significantly differ. Between the other pairs there are no significant differences. With the proviso that if the population would be greater and thus contain more cases within other groups of archetype rationalities, it would be likely that the differences between these groups become significant.

Multiple Comparisons

Dependent Variable: Perception (total), Tukey HSD

(I) archetype	(J) archetype	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Fatalistic residential	Hierarchic residential	-1,823*	,470	,003	-3,26	-,38
	Egalitarian residential	-,697	,365	,546	-1,81	,42
	Individualistic residential	-,574	,436	,891	-1,91	,76
	Fatalistic non-residential	-,194	,610	1,000	-2,06	1,67
	Hierarchic non-residential	-,728	,688	,964	-2,84	1,38
	Egalitarian non-residential	-,853	,688	,919	-2,96	1,25
	Individualistic non-residential	-,532	,726	,996	-2,75	1,69
Hierarchic residential	Fatalistic residential	1,823*	,470	,003	,38	3,26
	Egalitarian residential	1,126	,387	,075	-,06	2,31
	Individualistic residential	1,249	,454	,113	-,14	2,64
	Fatalistic non-residential	1,629	,623	,157	-,28	3,54
	Hierarchic non-residential	1,095	,700	,771	-1,05	3,24
	Egalitarian non-residential	,970	,700	,863	-1,17	3,11
	Individualistic non-residential	1,291	,737	,652	-,96	3,55
Egalitarian residential	Fatalistic residential	,697	,365	,546	-,42	1,81
	Hierarchic residential	-1,126	,387	,075	-2,31	,06
	Individualistic residential	,123	,344	1,000	-,93	1,18
	Fatalistic non-residential	,503	,548	,984	-1,18	2,18
	Hierarchic non-residential	-,031	,634	1,000	-1,97	1,91
	Egalitarian non-residential	-,156	,634	1,000	-2,10	1,78
	Individualistic non-residential	,165	,675	1,000	-1,90	2,23
Individualistic residential	Fatalistic residential	,574	,436	,891	-,76	1,91
	Hierarchic residential	-1,249	,454	,113	-2,64	,14
	Egalitarian residential	-,123	,344	1,000	-1,18	,93
	Fatalistic non-residential	,380	,598	,998	-1,45	2,21
	Hierarchic non-residential	-,154	,677	1,000	-2,23	1,92
	Egalitarian non-residential	-,279	,677	1,000	-2,35	1,79
	Individualistic non-residential	,042	,715	1,000	-2,15	2,23
Fatalistic non-residential	Fatalistic residential	,194	,610	1,000	-1,67	2,06
	Hierarchic residential	-1,629	,623	,157	-3,54	,28
	Egalitarian residential	-,503	,548	,984	-2,18	1,18
	Individualistic residential	-,380	,598	,998	-2,21	1,45
	Hierarchic non-residential	-,534	,801	,998	-2,99	1,92
	Egalitarian non-residential	-,659	,801	,992	-3,11	1,79
	Individualistic non-residential	-,338	,833	1,000	-2,89	2,21
Hierarchic non-residential	Fatalistic residential	,728	,688	,964	-1,38	2,84
	Hierarchic residential	-1,095	,700	,771	-3,24	1,05
	Egalitarian residential	,031	,634	1,000	-1,91	1,97
	Individualistic residential	,154	,677	1,000	-1,92	2,23
	Fatalistic non-residential	,534	,801	,998	-1,92	2,99
	Egalitarian non-residential	-,125	,861	1,000	-2,76	2,51
	Individualistic non-residential	,196	,892	1,000	-2,53	2,93
Egalitarian non-residential	Fatalistic residential	,853	,688	,919	-1,25	2,96
	Hierarchic residential	-,970	,700	,863	-3,11	1,17
	Egalitarian residential	,156	,634	1,000	-1,78	2,10
	Individualistic residential	,279	,677	1,000	-1,79	2,35
	Fatalistic non-residential	,659	,801	,992	-1,79	3,11
	Hierarchic non-residential	,125	,861	1,000	-2,51	2,76
	Individualistic non-residential	,321	,892	1,000	-2,41	3,05
Individualistic non-residential	Fatalistic residential	,532	,726	,996	-1,69	2,75
	Hierarchic residential	-1,291	,737	,652	-3,55	,96
	Egalitarian residential	-,165	,675	1,000	-2,23	1,90
	Individualistic residential	-,042	,715	1,000	-2,23	2,15
	Fatalistic non-residential	,338	,833	1,000	-2,21	2,89
	Hierarchic non-residential	-,196	,892	1,000	-2,93	2,53
	Egalitarian non-residential	-,321	,892	1,000	-3,05	2,41

*. The mean difference is significant at the 0.05 level.

Figure B.7. SPSS output: Tukey's test for hypothesis 2

The below presented effect size is the quantitative measure of the strength of the relation between perceptions and the archetype rationalities (figure B.8). It is the statistic output as a result of the Effect size test on hypotheses 2 and gives an Eta value of 0,27 and an Eta squared value of 0,074. The found value on Eta implicates a *Weak*

relation between perceptions and the archetype rationalities (Vocht, 2014, p.221). The here found effect size on Eta squared means that 7,4% of the variance on the degree of perception is explained by archetypes rationality.

Measures of Association

	Eta	Eta Squared
Perception * Archetype	,271	,074

Figure B.7. SPSS output: Effect size

Concluding remarks on test Hypothesis 2

The analysis of variance revealed that *the degree of perception in total* with regard to both groups, *Fatalistic residential actors* (M=1,9; SD=1,7) and *Hierarchic residential actors* (M=3,7; SD=2,3), was significantly different. F(1,5;7)=2,4; p=0,02. There is a *Weak relation*, 7% of the variance on the *degree of perception* is explained by the *archetypes rationality* (eta^2=0,074). Tukey test showed that within groups of archetype the Fatalistic residential actors and the Hierarchic residential actor differed significantly to the extent of degree of perception in total (p= 0,03). The differences between other archetype rationales are not significant. Regarding the question *"…which specific perception is typical for an archetype"* the information to investigate this aspect had to be distillated completely from the available *DATASET Kromme Rijn 50m 31 december 2016*. So the analysis had to be done based on descriptive statistics. To do so the scores of each rationality in each archetype was presented in a table (B.3). Based on the found patterns in this table the following interpretations have been made: Fatalistic residential actors feel Locked out and Uninformed (respectively 21% and 41%), Hierarchic residential actors see Expertise as the point of departure for applying Nature conservation (resp. 52%, 52%) Egalitarian residential actors however see Preservation (52%) as the method of Nature conservation (52%), Individualistic residential actors see the measure as Progress (68%) with new Opportunities (44%). To the extent of the Non-residential archetype, the Fatalistic non-residential actor feels above all Unheard (73%), the Hierarchic non-residential actors have a view that Rules (50%) and Control (38%) lead to appropriate Nature conservation (38%), while Non-residential Egalitarian see Nature conservation (86%) as some sort of Progress (43%), the non-residential Individualistic actor hold the same view on Nature conservation (71%) as Progress (57%) applies to the non-residential Individualistic actor as well. Only this group also sees Opportunities for such a development (43%). It is striking that across the board population the perception Nature conservation by 62%, is the most selected perception. In that sense that this perception occurred almost twice as often in the entire population as in the following perceptions Preservation (31%) and Technical solutions (29%). This suggests that the operationalization of this indicator has been too generic.

Testing Hypothesis 3

Partial test 3 examined: *To what extent certain archetypes base their rationalities on perspectives, and which specific perspective is typical for such an archetype*, which was except for the data to a large extent the same exercise as the testing of hypothesis 2. This test 3 was done in order to demonstrate the Hypothesis: *"In a certain sense, one can assign specific perspectives to the previously established archetypes"*. The hypothesis, which came with that research question was: *Assumed that the population can be generalized to archetypes, which perspective goes with each archetype*. Like the prior test a frequency table has been created. With that difference that here the in paragraph 3.4.2 (p.38) operationalized perspectives have been confronted to the in test 1 composed archetypes instead of perceptions. This exercise resulted into the on the next page presented *table B.4*. Like the test on hypothesis 2, prior to this test, also from this table (B.4) a certain patterns in relation between operationalized perceptions and archetypes of actors can be recognized. Yet, like the resembling prior test on hypothesis 2, in order to get more certainty about found patterns one have to perform an Analysis of Variance (ANOVA) for reasons who have been explained. And for the same reasons the information of *DATASET Kromme Rijn 50m 31 december 2016* – only this time regarding the chosen perspectives – needed to transformed into a interval/ratio scale. This all has been done in the exact same manner as preformed in partial test 2.

Descriptive statistics

So like partial test 2 the first exercise in this partial test (3) was a statistical analysis using descriptive statistics. The scores on *degree of perception in general* versus the *rationalities* of *archetypes* have been compared. The results of this analysis are presented in *figure B.9* on the next page. Both archetypes contain the four rationalities so the actual analysis compared these two archetypes based on their rationalities. The results of this analysis have been interpreted in the following way: Within the Residential category of archetype, the Fatalistic residential actors 2, Hierarchic residential actors score 2 as well, Egalitarian residential actors sore 1 and the Individualistic residential actors scored 1 as well. In the Non-residential category the Fatalistic non-residential actors score 2, Hierarchic non-residential actors score 2 as well, where Egalitarian non-residential score 1 and so do the Individualistic non-residential actors (1). The results of this test show for this population a complete equal distribution of total perspective to the extent of rationality degree within the two archetypes. In this distribution the perspective degree of the Fatalistic and the Hierarchical rationalities are, with the scores of 2, higher than the score of Egalitarian- and Individualistic actors. Who both score the lower mean of 1. Based on such a score the conclusion was drawn that the more grid-oriented rationalities (Hierarchism and Fatalists) base their worldviews and cultural biases for a larger share on *attitude towards* or how one *thinks about*; more value based so to say.

Thus as the range of scores for degree of perception of the former partial test (2) to the extent of degree of perspective, archetypes vary greatly by their rationality. Except for the Fatalistic residential actors – who all at least chose one perspective – there are always cases whose rationality is not intellectually based on any perception at all (figure B.9).

Report

Perspective

Archetype	N	Mean	Median	Std. Deviation	Minimum	Maximum
Fatalistic residential	29	2,10	1,00	1,345	1	5
Hierarchic residential	25	1,68	1,00	1,249	No perspective	4
Egalitarian residential	96	1,40	1,00	1,192	No perspective	6
Individualistic residential	34	1,44	1,00	1,211	No perspective	4
Fatalistic non-residential	11	1,55	1,00	1,440	No perspective	5
Hierarchic non-residential	8	1,88	1,50	1,959	No perspective	5
Egalitarian non-residential	8	1,38	1,50	,744	No perspective	2
Individualistic non-residential	7	1,43	2,00	,787	No perspective	2
Total	218	1,56	1,00	1,251	No perspective	6

Figure B.9. SPSS output: Statistical sizes of partial test 3

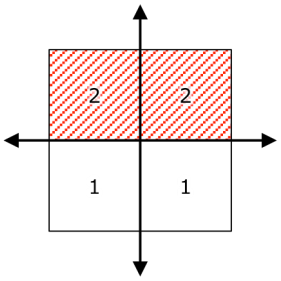


Figure B.10a. Mean scores on the degree of perspectives in the category Residentials

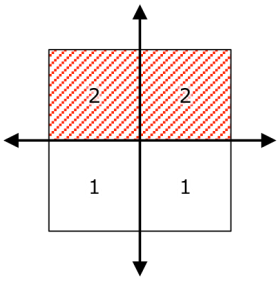


Figure B.10b. Mean scores on the degree of perspectives in the category Non-Residentials

The interquartile range (IQR) for the different rationalities by archetype have been counted by SPSS in the following way: Fatalistic residential actors (2) Hierarchic residential actors (2) Egalitarian residential actors (1) Individualistic residential actors (3), Fatalistic Non-residential actors (1), Hierarchic Non-residential actors (3), and Non-residential Egalitarian actors (4) and Non-residential Individualistic actors (4). Most of the rationalities within the archetypes feature a score around the median (1-2), however two groups seems to exhibit a higher concentration than other rationalities, namely the Individualistic residential group (3) and the Hierarchic Non-residential group (4). To draw conclusion on this pattern is a difficult exercise, because both groups are in every aspect (archetype, grid- and group feature) each other's opposite. The most obvious conclusion here would be that the results are based on coincidence (figure B.10).

Descriptives

Archetype			Statistic	Std. Error
Perspectives (total)	Fatalistic residential	Interquartile Range	2	
	Hierarchic residential	Interquartile Range	2	
	Egalitarian residential	Interquartile Range	1	
	Individualistic residential	Interquartile Range	3	
	Fatalistic non-residential	Interquartile Range	1	
	Hierarchic non-residential	Interquartile Range	4	
	Egalitarian non-residential	Interquartile Range	1	
	Individualistic non-residential	Interquartile Range	1	

Figure B.11. SPSS output: Descriptive table test 3 (clipped version)

Statistical conclusions test Hypothesis 3

Before conducting the actual variance analysis, the first exercise that was to check on the presuppositions for preforming the ANOVA test (figure B.12). Because as already noted, not all groups within the dataset where equally in size. The output of this test showed that group variances of the dataset did differ significantly (sig>0,05). In that sense, the set met the condition of homogeneity.

Test of Homogeneity of Variances

Perspectives (total)

Levene Statistic	df1	df2	Sig.
1,914	7	210	,069

Figure B.12. SPSS output: Levene test for hypothesis 3

The next exercise in this partial test (3) was to perform the actual ANOVA test by SPSS, based on the nominal variable archetypes and the ratio variable perspectives (total). The results are presented in figure B.13 below. The most important – and most disappointing – conclusion drawn from this exercise is that it did not resulted into a significant outcome (Sig.> 0,05).

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Perspective * Archetype	Between Groups	(Combined)	13,178	7	1,883	1,210	,298
	Within Groups		326,662	210	1,556		
	Total		339,839	217			

Figure B.13. SPSS output: ANOVA test for hypothesis 2

Following that conclusion the Null hypothesis (H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6=\mu_7=\mu_8$) was maintained. Which implicates that to the extent of *total count of chosen perspective* the eight groups do not vary significantly from each other. The test statistic F=1,2 has a significance of more than 0,05. This means that with a 95% confidence, *all the eight groups are equal to each other*, and earlier in this partial test found patterns have a high risk to be based on coincidence.

Concluding remarks on test Hypothesis 3

The ANOVA test revealed that *the degree of perspective in total* with regard to the archetype rationalities, was not significantly different. F(7;210)=1,2; p=0,3. The in this partial test (3) drawn conclusions about found patterns, feature no certainty.

Table B.4. Perspectives; Percentage (%) within the archetypes

Perceptions	**%**	**Archetype**							
		Residential				*Non-residential use*			
	of pop.	F[1)]-actor	H[2)]-actor	E[3)]-actor	I[4)]-actor	F[5)]-actor	H[6)]-actor	E[7)]-actor	I[8)]-actor
Risk	*8%*	*10%*	*20%*	*5%*	*4%*	*9%*	*25%*	-	-
Strict	*2%*	*3%*	*4%*	-	*3%*	-	*13%*	*13%*	-
Discipline	*2%*	-	*12%*	*1%*	*3%*	-	-	-	-
Caution	*8%*	*7%*	*24%*	*5%*	*3%*	*9%*	*38%*	-	-
Authority	*6%*	*7%*	*16%*	*3%*	*3%*	-	*25%*	*13%*	-
Fragility	*2%*	-	-	*5%*	-	-	-	-	-
Anxiety	*12%*	*17%*	*8%*	*14%*	*3%*	*9%*	*38%*	*13%*	*14%*
Equality	*2%*	-	-	*4%*	-	-	-	-	-
Value	*12%*	*12%*	*18%*	*6%*	*15%*	-	-	*25%*	*29%*
Environment	*42%*	*17%*	*32%*	*59%*	*24%*	*18%*	*25%*	*88%*	*14%*
Unlimited	*1%*	-	*4%*	-	*3%*	*9%*	-	-	-
Liberty	*9%*	*7%*	*8%*	*8%*	*18%*	-	-	-	*14%*
Success	*14%*	-	*16%*	*5%*	*50%*	-	-	-	*71%*
Performance	*1%*	-	-	*3%*	-	-	-	-	-
Self-determination	*4%*	*3%*	-	*2%*	*12%*	-	-	-	*14%*
Powerless	*8%*	*45%*	-	-	*3%*	*36%*	-	-	-
Distrustful	*6%*	*31%*	-	*1%*	-	*27%*	*13%*	-	-
Uninterested	*2%*	*7%*	-	*1%*	-	*9%*	-	-	-
Unknown	*10%*	*45%*	-	*5%*	*6%*	*18%*	-	-	-
Insignificant	*2%*	*14%*	-	-	-	-	*13%*	-	-

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

To the extent of the search for "…*which specific perception is typical for an archetype"* conclusions regarding this aspect of hypothesis 3 have been completely drawn from the information gathered in table B.4. So the analysis is done based on descriptive statistics are about the score of degree of perception within each of the rationalities of each archetype. The in this table (B.4) found patterns have been interpreted in the following way: Fatalistic residential actors see themselves as *powerless* and *unknown* (both 45% and 45%), Hierarchic residential actors mainly see *caution* as the best way of dealing with *environmental* circumstances (resp. 24%, 32%), Egalitarian

residential actors are more *anxious* (14%) for any measure. So if any measure is taken, *environmental* protection (59%) should be involved. Individualistic residential actors see a measure rather as *success* (50%) for the *environment* (24%). The patterns found on the Non-residential archetype: the Fatalistic non-residential actor feels *powerless* (36%) which results into an attitude of *distrust* (27%), the Hierarchic non-residential actors feel the need for *caution* (38%) out of *anxiety* (38%) for circumstances in their spatial area, while Non-residential Egalitarian *value* (25%) their *environment* (88%) highly, so an eventual measures may under no circumstance diminish it. The Non-residential Individualistic actor sees environmental *values* (e.g. natural value or cultural heritage) rather as a chance to *successfully* improve the environmental circumstances (resp. 29%-71%). To the extent of perceptions it appears that the perception on e*nvironment* is leading (42%). This specific indicator has an almost four times bigger share than all the others.

Testing Hypothesis 4

This last partial test (4) is an examination on: *A statistical correlation between the variable archetype of actor, and the preference of incentive such an archetype features.* By incentives that can be deployed in order to gain cooperation for implementing river management measures. The variable archetype was obtained through partial test 1. Data with respect to incentives have been distilled from the target population by survey in a manner as described in section 3.3. This partial test (4) was done in order to demonstrate Hypothesis 4. Which was formulated the following way: *"Each archetype has certain sensitivity to particular incentives"*. That specific assumption leads to the query: *To what extent, do the assumed archetypes exhibiting shared preferences towards certain incentives*. Quite the same as in partial test 1, the initial idea was to prove this hypothesis based on a frequency table in which archetype data would be confronted to the data on incentives. This would result in a cross table such as table B.5. In this table (B.5) all the possible archetypes of actors are linked to preferred incentives. The idea behind the exercise was to expose patterns of preference for each archetype. However, again the Cochran presuppositions for preforming a Chi-square test where the reason that this approach could not be executed, because the frequency table (B.5) does not meet these demands. So basically it is impossible to apply a statistical Chi-square test in order to test the significance and strength of this possible correlation. Merging categories was again a necessary exercise.

Table B.5. Incentives; Percentage (%) within the archetypes

Incentives	**Archetype**							
	Residential				Non-residential use			
	F[1)]-actor cases ratio (N) - (%)	H[2)]-actor cases ratio (N) - (%)	E[3)]-actor cases ratio (N) - (%)	I[4)]-actor cases ratio (N) - (%)	F[5)]-actor cases ratio (N) - (%)	H[6)]-actor cases ratio (N) - (%)	E[7)]-actor cases ratio (N) - (%)	I[8)]-actor cases ratio (N) - (%)
Risk & Safety	*3 - 12%*	*3 - 12%*	*10 - 40%*	*4 - 16%*	*2 - 8%*	*-*	*1 - 4%*	*2 - 8%*
Caution, Control & Expertise	*1 - 50%*	*1 - 50%*	*-*	*-*	*-*	*-*	*-*	*-*
Rules, Strategy, Strict, Discipline & Expertise	*3 - 6%*	*10 - 20%*	*25 - 49%*	*7 - 14%*	*1 - 2%*	*3 - 6%*	*1 - 2%*	*1 - 2%*
Fragility & Nature conservation	*-*	*1 - 7%*	*7 - 50%*	*2 - 14%*	*2 - 14%*	*1 - 7%*	*1 - 7%*	*-*
Value, Environment & Preservation	*2 - 7%*	*3 - 10%*	*19 - 61%*	*4 - 13%*	*-*	*2 - 7%*	*1 - 3%*	*-*
Care, Social-Spirited, Support & Equality	*2 - 7%*	*3 - 11%*	*14 - 50%*	*5 - 18%*	*-*	*-*	*3 - 11%*	*1 - 4%*
Progress, Opportunity & Improvement	*1 - 14%*	*-*	*1 - 14%*	*2 - 29%*	*1 - 14%*	*-*	*-*	*2 - 29%*
Commercial, Liberty, Unlimited & Opportunity	*1 - 100%*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
Progress & Improvement	*-*	*-*	*-*	*2 - 50%*	*1 - 25%*	*1 - 25%*	*-*	*-*
Powerless, Unheard & Locked-out	*8 - 30%*	*1 - 4%*	*9 - 33%*	*6 - 22%*	*1 - 4%*	*1 - 4%*	*-*	*1 - 4%*
Distrustful, Unknown & Uninformed	*5 - 22%*	*3 - 13%*	*9 - 39%*	*2 - 9%*	*3 - 13%*	*-*	*1 - 4%*	*-*
Unfair & Undergo	*3 - 60%*	*-*	*2 - 40%*	*-*	*-*	*-*	*-*	*-*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Data adjustment

To become able to preform a Chi-square test one necessary adjustment had to be made namely: *The incentives distilled from survey had to be merged into four broader categories of incentive type*. Another necessary exercise was to switch back to Rationalities instead of archetypes. That last exercise is a major clear-cutting to the test of hypothesis 4, however due to the Cochran presuppositions there was no other choice but to reduce the categories. The exercise of merging archetypes back into rationalities was defendable for the fact that: 1) *The categories of archetypes are so limited and quite clear in their dominant rationality*, and 2) *The most common perceptions and perspectives for each archetype has been tested in respectively partial test 1 till 3.* By merging the *incentives* into *incentive types* the detailing was given up anyway. Thus the here tested broad categories of incentive types who are going to be linked to rationalities, can be easily assigned to the archetypes soon preferences are clear. Following chapter 3.5 the incentive types have been formulated as: 1) *Incentives about robustness*, who responds to *Risk*,

Safety, *Caution*, *Control*, *Expertise, Rules*, *Strict*, *Discipline* and *Expertise*, 2) *Incentives about protecting values*, responding to *Fragility*, *Nature conservation*, *Value*, *Environment*, *Preservation*, *Care*, *Social-spirited* and *Equality*, 3) *Incentives about possession* who should respond to *Progress*, *Opportunity*, *Improvement*, *Commercial*, *Liberty*, *Unlimited*, *Opportunity*, *Progress* and *Improvement*, and 4) *Incentives about getting involved* who are responding to *Powerless*, *Unheard*, *Locked-out*, *Distrustful*, *Unknown*, *Uninformed*, *Unfair* and *Undergo*.

Statistical conclusions test Hypothesis 4

In order to execute a Chi-square test in SPSS the first exercise was drafting a cross table in which the categorical variables of *incentive type* and *rationality* are confronted towards each other. The below presented cross table (table B.6) contains both the absolute frequencies (N), measured by survey, and relative frequencies expressed in percentages (%) of the share of the considered variable; in this partial test (4) rationality.

Table B.6. Cross table; Incentivetype vs. rationalities

Incentive types	**Rationalities**								**Total**	
	Fatalistic		Hierarchic		Egalitarian		Individualistic			
	Cases (N)	Ratio (%)	Cases (N)	Ratio (%)	Cases (N)	Ratio (%)	Cases (N)	Ratio (%)	Cases (N)	Ratio (%)
Incentives about robustness	*10*	*13%*	*16*	*21%*	*36*	*48%*	*13*	*17%*	*75*	*100%*
Incentives about protecting	*6*	*8%*	*11*	*15%*	*45*	*60%*	*13*	*17%*	*75*	*100%*
Incentives about possession	*4*	*33%*	*1*	*8%*	*2*	*17%*	*5*	*42%*	*12*	*100%*
Incentives about getting involved	*20*	*36%*	*5*	*9%*	*21*	*38%*	*10*	*18%*	*56*	*100%*
Total	*40*	*18%*	*33*	*15%*	*104*	*48%*	*41*	*19%*	*218*	*100%*

(Source: DATASET - Kromme Rijn 50m 30 december 2016)

Based on percentages in cross table B.6 interpretations regarding the influence of the variable *incentive type* on the variable actor *Rationality*, have been made. The implication of the confrontation is about proving, the preference of a certain kind of actor with a certain kind of rationality towards a certain type of incentive. Within the for this research project considered catchment area of the Kromme Rijn, there are actors who feature a more Fatalistic rationality. This type of actor seem to have a much higher preference for incentives with regard to *getting involved with the plans* (36%) to the extent of *their possessions* (33%). The actors who feature a more Hierarchic rationality favor incentives regarding Robust measures (21%) for Protecting environmental circumstances (15%). At the same time the actors within this Kromme Rijn catchment area who feature an Egalitarian rationality, have a very clear preference for the Protection of values (60%). These actors are more sensitive for Robust measures for Protecting (48%) those. The actors who feature an Individualistic kind of rationality have a clear preference for incentives with regard to possession (42%). The assessment of this partial test (4) was conducted to demonstrate whether or not there is a statistical relation between the Rationality of actors along the river Kromme Rijn and their preferred incentive types for cooperating with the implementation of river management measures. To serve this aim, the following null hypothesis was formulated:

- H_0: *Observed frequencies = expected frequencies*. There is no statistical relation between the *Observed frequencies* and the *expected frequencies* in *incentive type*;
- H_A: *Observed frequencies ≠ expected frequencies*. There is a statistical relation between the *Observed frequencies* and the *expected frequencies* in *incentive type*.

Note a. underneath the Chi-square test table (figure B.14) indicates that 18,8% of the expected cell frequencies are less than 5, and that the smallest expected value is 1,82. Although to the edge of acceptable the database complies with the rule of Cochran. The Pearson Chi-Square is 29,3. The associated probability of exceedance is Asymp. Sig.=0,001, with a degree of freedom df=9. The exceedance probability is smaller than the confidence interval 0,05 which means that the null hypothesis is not rejected; there is no statistical relation between the *Observed frequencies* and the *expected frequencies* incentive types.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29,342[a]	9	,001
Likelihood Ratio	28,313	9	,001
Linear-by-Linear Association	4,171	1	,041
N of Valid Cases	218		

a. 3 cells (18,8%) have expected count less than 5. The minimum expected count is 1,82.

Figure B.14. SPSS output: Chi-square test for hypothesis 4

Concluding remarks on test Hypothesis 4
Based on a Chi-square test conducted in the statistical program SPSS, the claim drawn for this partial test on hypothesis 4 cannot remain. There was no significant relationship found, $X^2(9)=29,3$; $p<0,05$, between *incentive types* and *rationalities* of actors who have property along the catchment of the river Kromme Rijn. Cross table B.6 shows that Fatalistic actors prefer a for Getting involved in planning, while Hierarchic actors rather prefer the guarantee of Robust measures. The Egalitarian actor demands the Protection of values in a plan, and the more Individualistic actor is sensitive for Possession related incentives. However these patterns risk to be based on coincidence.

Reflection
By reporting the analysis, the empirical part of this research project is completed. Although there have been results achieved who are inline with the theoretical framework, this part of the project went quite turbulent. So any reflective notes based on progressive insights are not inappropriate here. Insights with respect to, 1) *The operationalization*, 2) *The chosen method for testing Hypothesis 2 and 3*, and also with regard to 3) *The choice of the research area*, the approach of this project can not pass by uncritically. Below a discussion on these points in brief:

Ad 1) The operationalization: When translating the information from the returned Postcards and the collected Door-to-Door forms, towards a useful dataset, already at an early stage it appeared, that within the whole population there was a disproportionate preference for the indicator *Nature conservation*. This probably has led to a representation of the Rationality of Egalitarians, which was out of proportion, and had also a major impact on the research on the degree of perception and perspective. These alleged distortion of the researched reality is the result of a too generic – and therefore not distinctive – operationalization of this indicator. A probable reason for this shortcoming is a perspectival approach to research, caused by too much focus on what is described by theory and too little sense at a possible interpretation in practice by interviewees who are not familiar with the theory and background of the experiment and thus have not the same connotations. The survey literally poses the question: *"If the Water Authority wants to develop a Nature friendly Shoreline on/along your property, what will be important for you"*. If there had been more attention to the factor of possible interpretation – and less focus to what theory prescribes – the indicator *Nature conservation* would have been left out of the survey, because that specific indictor (Nature conservation) is likely to have a generic association with the development of nature friendly shorelines. And turned out to be an obvious choice for the interviewees who participate in the experiment. Note that the at the beginning of the project there was indeed awareness for aspect of ecological validity (paragraph 3.2.1), however along the operationalization process a perspectival attitude due to theoretical bias probably got grip on the implementation. Advice for further research: Operationalization of indicators to be used in survey have to be to be tested more extensively on ecological validity by individuals who are independent from the project, and thereby reducing the risk of bias;

Ad 2) The chosen method for testing Hypothesis 2 and 3: Basically the idea behind hypothesis 2 and 3 was assigning specific perceptions and perspectives to the previously found archetypes. Based on the current research strategy (figure 3.1) some results have been achieved, however it may be considered whether there are methods that can generate more evident results. The lack of detail has partly to do with the fact that: a) *The archetypes could not be named in detail*, but above all b) *The information from the survey was not completely suitable for a more desirable analysis*; the factor analysis. The reason why the current strategy of *Descriptive statistics* combined with a *Variance analysis* was chosen had to do with the design of the survey. As stated in section 3.3.2 the project had to deal with a high risk of non-respond. To overcome this risk a very simple – and thus accessible – survey design has been chosen in order to keep participating as attractive as possible. For applying a factor analysis it is however necessary to introduce a (*Likert-)scale*, which was deliberately kept out of the survey in order to keep it short and simple. In short, the non-application of a factor analysis was the result of a trade-off; Accessibility of the survey in need of response versus Accuracy to the extent of detailed evidence. The choice for the first option was based on the idea that no response would lead to any analysis at all. Advice for future research: The introduction of a scale into the survey is desired; a (*Likert-)scale* in relation to the indicators on perceptions and perspectives;

Ad 3) The choice of the research area: The research area was mainly selected on the accessibility of data on property (land plots) and their owners along any river catchment. Initially, it was the intention to perform the project on the catchment of either the river Wupper or the river Lippe in the German state of *Nortrein-Westfalen*. However, the German *Federal Data Protection Act* (1990) prohibits institutions to provide of personal data (BDSG, 1990; EC, 1995). Personal data is defined as *"…any information concerning the personal or material circumstances of an identified or identifiable individual…"* (section 3, sub 1). So because of this privacy law it was not possible to obtain the information necessary for the experiment within any short terms. Therefore a catchment area in the immediate vicinity of the Utrecht University Faculty of Geosciences was on obvious choice because of a close relationship with the prevailing water authority *Hoogheemraadschap Stichtse Rijnlanden*. This connection made it possible to get access the required data for creating a sample for all catchments within their management area. The choice for the Kromme Rijn catchment was evident; 1) *On the watercourse of the Kromme Rijn rest a declarations from WFD-water tasks*, and 2) *Measures in order to fore fill these WFD-tasks have recently (2010-2016) been implemented along this catchment*. The idea here was that an interviewee from this area would have a strong feeling to the extent of WFD-measures, which utterly should benefit the quality of the research. However, afterwards the population appeared to be quite homogeneous with regard to Zoning-types, which resulted in an under-

representation of certain Land-uses. This harked back on the formation of archetypes, as these could not composed as detailed as they initially were intended – an assembly of both *Zoning* and *Rationality* –, so the project has not progressed beyond a division into two very generic archetypes. Which obviously has been a clear cut for the research.
Advice for future research: 1) *Selecting bigger populations*, and 2) *Composing a dataset based on a stratified sample*.

Unfortunately, these findings emerged to the surface too late in the process, so that at this present moment in the trajectory it is no longer possible to adjust the course of project other than that the whole project should be started from scratch again. The latter statement is mainly due to the fact that the above mentioned points require the survey to be re-drafted and to be plotted in a whole new experiment. Given the fact that this is an exploratory research within the scope of obtaining a Master's degree (MSc. Urban and Regional Development), it seems at this point in the process no meaningful exercise to completely dismiss the project. The results are sufficiently distinctive that it can serve as an exploratory study, and based on the lessons learned further research can be are formulated. The results provide sufficient basis to further research on the impact of the mechanisms of Plurality and Cultural Theory in the implementation process of Public Works. And it gives as well food for thoughts on whether the *"Prism"*-concept can perhaps fill the gap in the effectiveness on the planning processes of public works in general and river management measures in particular.

Notes

1 Valid dataset: Based on a calculation by SurveyMonkey the exact needed numbers of response would be 210. This caluclation was based on a *Population* of 458, a *Confidence level* of 95%, and a *Margin of Error* of 5%. (SurveyMonkey, 2016).
2 Cochran-rule: Presuppositions for preforming a Chi-square test are: 1) *All expected cell frequencies are greater than or equal to 1*, and 2) *Up to 20% of the expected cell frequencies lie between 1 and 5* (Field, 2013, p.742; Vocht, 2013, p.151; Vocht, 2015, p.144).

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Appx.C The Target Population (sample)

Case	Street	Postcode	Municipality	Location		Response
1	Rijndijk 1	3962MX	WYK BY DUURSTEDE	0		[NR]
2	Het Sant 4	3962TB	WYK BY DUURSTEDE	1	o.a.	[NR]
3	Het Sant 1	3962TA	WYK BY DUURSTEDE	2		[RP]
4	K. de Grotestraat 30	3962CL	WYK BY DUURSTEDE	3	o.a.	[NR]
5	Prins Hendrikweg 12 A	3962EL	WYK BY DUURSTEDE	5	o.a.	[RP]
6	Wilhelmus Peekhof 1	3984JZ	ODYK	7		[RD]
7	Poldermolen 2	3994DD	HOUTEN	8	o.a.	[RP]
8	Schadeijkerweg 8	3984LH	ODYK	9		[NR]
9	Werkhovenseweg 7	3984LG	ODYK	11	o.a.	[RD]
10	Werkhovenseweg 15	3985MG	WERKHOVEN	14	o.a.	[NR]
11	Beverweertseweg 14	3985RD	WERKHOVEN	17	o.a.	[RD]
12	Nieuweweg 65	3962ET	WYK BY DUURSTEDE	19		[NR]
13	Singel 51	3961CH	WYK BY DUURSTEDE	21		[NR]
14	Kerkstraat 20	4191AB	GELDERMALSEN	24	o.a.	[NR]
15	Rijndijk 2	3962MX	WYK BY DUURSTEDE	25	o.a.	[NR]
16	Prins Hendrikweg 8	3962EL	WYK BY DUURSTEDE	27		[RP]
17	Prins Hendrikweg 8A	3962EL	WYK BY DUURSTEDE	28		[NR]
18	Prins Hendrikweg 10	3962EL	WYK BY DUURSTEDE	29		[RP]
19	Prins Hendrikweg 10A	3962EL	WYK BY DUURSTEDE	30		[NR]
20	Prins Hendrikweg 12	3962EL	WYK BY DUURSTEDE	31	o.a.	[RD]
21	De Kolk 51	3962GD	WYK BY DUURSTEDE	32		[RD]
22	Zaagmolen 52	3962GB	WYK BY DUURSTEDE	33		[RD]
23	Zaagmolen 50	3962GB	WYK BY DUURSTEDE	34		[NR]
24	Herenstraat 46	3985RW	WERKHOVEN	37		[RD]
25	Werkhovenseweg 21	3985MG	WERKHOVEN	40		[RD]
26	Molenhoeflaan 2	3985MJ	WERKHOVEN	44		[RP]
27	Singelpark 1	3984NC	ODYK	51	o.a.	[RD]
28	Groenewoudenseweg 7A	3945BC	COTHEN	54		[NR]
29	Nachtegaal 83	3962TK	WYK BY DUURSTEDE	55	o.a.	[RP]
30	Nachtegaal 81	3962TK	WYK BY DUURSTEDE	56	o.a.	[RP]
31	Nachtegaal 79	3962TK	WYK BY DUURSTEDE	57	o.a.	[NR]
32	Langbroekerdijk 24	3972ND	DRIEBERGEN RYSENB	58	o.a.	[NR]
33	Archimedeslaan 6	3584BA	UTRECHT	63	o.a.	[NR]
34	Singel 1C	3961CE	WIJK BIJ DUURSTEDE	67	o.a.	[NR]
35	Bunnikseweg 39	3732HV	DE BILT	69	o.a.	[NR]
36	Krommerijnder 8	3962GG	WYK BY DUURSTEDE	71		[NR]
37	Krommerijnder 29	3962GG	WYK BY DUURSTEDE	72		[NR]
38	Krommerijnder 28	3962GG	WYK BY DUURSTEDE	73		[RD]
39	Krommerijnder 27	3962GG	WYK BY DUURSTEDE	74		[RD]
40	Krommerijnder 26	3962GG	WYK BY DUURSTEDE	75		[NR]
41	Krommerijnder 25	3962GG	WYK BY DUURSTEDE	76		[NR]
42	Krommerijnder 24	3962GG	WYK BY DUURSTEDE	77		[RD]
43	Krommerijnder 12	3962GG	WYK BY DUURSTEDE	78		[RD]
44	Krommerijnder 11	3962GG	WYK BY DUURSTEDE	79		[RD]
45	Krommerijnder 10	3962GG	WYK BY DUURSTEDE	81		[NR]
46	Krommerijnder 17	3962GG	WYK BY DUURSTEDE	82		[I]
47	Krommerijnder 7	3962GG	WYK BY DUURSTEDE	83		[RP]
48	Krommerijnder 6	3962GG	WYK BY DUURSTEDE	84		[NR]
49	Krommerijnder 5	3962GG	WYK BY DUURSTEDE	85		[RD]
50	Krommerijnder 4	3962GG	WYK BY DUURSTEDE	86		[RD]
51	Krommerijnder 3	3962GG	WYK BY DUURSTEDE	87		[RD]
52	Krommerijnder 2	3962GG	WYK BY DUURSTEDE	88		[RD]
53	Krommerijnder 1	3962GG	WYK BY DUURSTEDE	89		[RP]
54	Groenewoudenseweg 7	3945BC	COTHEN	91		[NR]
55	Het Sant 8	3962TB	WYK BY DUURSTEDE	92		[RP]
56	Het Sant 6	3962TB	WYK BY DUURSTEDE	93		[NR]
57	Het Sant 2	3962TB	WYK BY DUURSTEDE	95		[NR]
58	Prins Hendrikweg 20	3962EL	WYK BY DUURSTEDE	97		[NR]
59	Korte Singel 0		WYK BY DUURSTEDE	100		[NR]
60	Korte Singel 0		WYK BY DUURSTEDE	101	o.a.	[NR]
61	Blauwe Pannen 19	3962GE	WYK BY DUURSTEDE	109	o.a.	[RD]
62	Blauwe Pannen 21	3962GE	WIJK BIJ DUURSTEDE	110	o.a.	[NR]
63	Blauwe Pannen 23	3962GE	WYK BY DUURSTEDE	111	o.a.	[NR]
64	Blauwe Pannen 25	3962GE	WIJK BIJ DUURSTEDE	112	o.a.	[NR]
65	Blauwe Pannen 17	3962GE	WYK BY DUURSTEDE	113		[NR]
66	Blauwe Pannen 15	3962GE	WYK BY DUURSTEDE	114		[RD]
67	Blauwe Pannen 13	3962GE	WYK BY DUURSTEDE	115		[RP]
68	Vitruvius 17	3962SE	WYK BY DUURSTEDE	116		[NR]
69	Blauwe Pannen 3	3962GE	WYK BY DUURSTEDE	117		[NR]

Case	Street	Postcode	Municipality	Location		Response
70	Blauwe Pannen 16	3962GE	WYK BY DUURSTEDE	118		[RP]
71	Blauwe Pannen 14	3962GE	WYK BY DUURSTEDE	119		[RD]
72	Blauwe Pannen 12	3962GE	WYK BY DUURSTEDE	120		[RP]
73	Van Gochstraat 37	2811VX	REEUWYK	121		[NR]
74	Blauwe Pannen 4	3962GE	WYK BY DUURSTEDE	122		[NR]
75	Blauwe Pannen 6	3962GE	WYK BY DUURSTEDE	123		[RD]
76	Prins Hendrikweg 18	3962EL	WYK BY DUURSTEDE	125		[NR]
77	Prins Hendrikweg 18	3962EL	WYK BY DUURSTEDE	126	o.a.	[RD]
78	Singel 1C	3961CE	WIJK BIJ DUURSTEDE	129		[NR]
79	Prins Hendrikweg 21	3962EK	WYK BY DUURSTEDE	131		[RP]
80	Graaf van Lynden van Sandenburgweg 7	3962RB	WIJK BIJ DUURSTEDE	133	o.a.	[NR]
81	Ossenwaard 8	3945PG	COTHEN	134	o.a.	[NR]
82	Zandpad 13	3945BA	COTHEN	135		[RD]
83	Graaf van Lynden van Sandenburgweg 12	3962RB	WIJK BIJ DUURSTEDE	136	o.a.	[NR]
84	Zandpad 25	3945BA	COTHEN	137	o.a.	[NR]
85	Rhijnestein 2	3945BD	COTHEN	142	o.a.	[RP]
86	Zandpad 17	3945BA	COTHEN	147		[RD]
87	Zandpad 19	3945BA	COTHEN	148	o.a.	[RD]
88	Zandpad 21	3945BA	COTHEN	149		[RD]
89	Groenewoudenseweg 1	3945BB	COTHEN	150	o.a.	[NR]
90	Dorpsstraat 1B	3945BJ	COTHEN	151	o.a.	[NR]
91	Uitveld 6	3945ET	COTHEN	152		[NR]
92	Zandpad 10	3945BA	COTHEN	153	o.a.	[NR]
93	Zandpad 4	3945BA	COTHEN	154		[NR]
94	Graaf van Lynden van Sandenburgweg 10	3962RB	WIJK BIJ DUURSTEDE	155	o.a.	[NR]
95	Zandpad 27	3945BA	COTHEN	157		[NR]
96	Trechtweg 7	3945PL	COTHEN	161	o.a.	[RP]
97	Zandpad 11	3945BA	COTHEN	162		[NR]
98	Beusichemseweg 43	3997MH	T GOY	167		[NR]
99	Steenovenweg 5	3985SJ	WERKHOVEN	171		[RD]
100	Leemkolkweg 4	3985SL	WERKHOVEN	174		[RD]
101	Korte Zuwe 1	3985SM	WERKHOVEN	177		[RD]
102	Korte Zuwe 2A	3985SM	WERKHOVEN	178	o.a.	[RD]
103	Korte Zuwe 2	3985SM	WERKHOVEN	179		[RD]
104	Promenade 39	3962HA	WYK BY DUURSTEDE	187		[NR]
105	Rijnseweg 14	3984NG	ODYK	189		[NR]
106	Karperlaan 17	3984MH	ODYK	191		[RD]
107	Karperlaan 19	3984MH	ODYK	192		[NR]
108	Karperlaan 21	3984MH	ODYK	193		[RD]
109	Reigerwaard 3	3984MJ	ODYK	194		[RP]
110	Reigerwaard 4	3984MJ	ODYK	195		[NR]
111	Reigerwaard 5	3984MJ	ODYK	204		[NR]
112	Reigerwaard 6	3984MJ	ODYK	205		[NR]
113	Karperlaan 6	3984MH	ODYK	206		[NR]
114	Karperlaan 8	3984MH	ODYK	207		[RD]
115	Karperlaan 10	3984MH	ODYK	208		[NR]
116	Beverweertseweg 36	3985RE	WERKHOVEN	211		[RD]
117	Keizer 76	3962EZ	WYK BY DUURSTEDE	212		[NR]
118	Zaagmolen 42	3962GB	WYK BY DUURSTEDE	213		[RP]
119	Zaagmolen 44	3962GB	WYK BY DUURSTEDE	214		[NR]
120	Zaagmolen 46	3962GB	WYK BY DUURSTEDE	215		[NR]
121	Zaagmolen 48	3962GB	WYK BY DUURSTEDE	216		[NR]
122	Prins Hendrikweg 13	3962EK	WYK BY DUURSTEDE	217		[NR]
123	Leemkolkweg 18	3985SL	WERKHOVEN	219		[NR]
124	Prins Hendrikweg 14	3962EL	WYK BY DUURSTEDE	220		[NR]
125	Ommershoflaan 3	6861CK	OOSTERBEEK	227		[NR]
126	Elspeterweg 22	8071PA	NUNSPEET	228	o.a.	[NR]
127	Nachtegaal 77	3962TK	WYK BY DUURSTEDE	233		[RD]
128	Landscheidingsweg 4	3947NG	LANGBROEK	236		[NR]
129	Krommerijnder 13	3962GG	WYK BY DUURSTEDE	237		[RP]
130	Lloydstraat 116	3024EA	ROTTERDAM	238		[NR]
131	Krommerijnder 15	3962GG	WYK BY DUURSTEDE	239		[RP]
132	Krommerijnder 16	3962GG	WYK BY DUURSTEDE	240		[NR]
133	Blaak 8	3011TA	ROTTERDAM	245	o.a.	[NR]
134	Krommerijnder 8	3962GG	WYK BY DUURSTEDE	250	o.a.	[NR]
135	Prins Hendrikweg 16	3962EL	WYK BY DUURSTEDE	252		[NR]
136	Karperlaan 13	3984MH	ODYK	253		[RD]
137	Meerkoetwaard 6	3984MK	ODYK	254		[NR]
138	Meerkoetwaard 5	3984MK	ODYK	255		[RP]
139	Meerkoetwaard 4	3984MK	ODYK	256		[RD]
140	Meerkoetwaard 3	3984MK	ODYK	257		[RD]
141	Meerkoetwaard 2	3984MK	ODYK	258		[RD]
142	Meerkoetwaard 1	3984MK	ODYK	259		[NR]

Case	Street	Postcode	Municipality	Location		Response
143	De Kolk 49	3962GD	WYK BY DUURSTEDE	263		[RP]
144	Krommesteeg 3	3984NE	ODYK	264	o.a.	[RD]
145	Leemkolkweg 16A	3985SL	WERKHOVEN	265		[RD]
146	Rijnseweg 14	3984NG	ODYK	271		[RP]
147	Ossenwaard 4	3945PG	COTHEN	281		[RP]
148	Beatrixstraat 2	3945CR	COTHEN	282	o.a.	[NR]
149	Ossenwaard 2D	3945PG	COTHEN	283	o.a.	[RD]
150	Langbroekerdijk34	3972ND	DRIEBERGEN-RIJSENBURG	292		[NR]
151	D. van Bourgondieweg 1	3961VZ	WIJK BIJ DUURSTEDE	293		[RP]
152	Nieuweweg 67	3962ET	WYK BY DUURSTEDE	294		[NR]
153	Stellingmolen 11	2406KS	ALPHEN AAN DEN RYN	296		[NR]
154	Graaf van Lynden van Sandenburgweg 2	3945PB	COTHEN	297		[NR]
155	Graaf van Lynden van Sandenburgweg 14	3962RB	WIJK BIJ DUURSTEDE	298		[NR]
156	Graaf van Lynden van Sandenburgweg 8	3962RB	WIJK BIJ DUURSTEDE	302		[NR]
157	Prins Hendrikweg 13	3962EK	WYK BY DUURSTEDE	305		[NR]
158	Leemkolkweg 18	3985SL	WERKHOVEN	306	o.a.	[NR]
159	Molenspoor 2	3985SH	WERKHOVEN	309	o.a.	[RD]
160	Graaf van Lynden van Sandenburgweg 21	3945PA	COTHEN	312	o.a.	[NR]
161	Korte Zuwe 1	3985SM	WERKHOVEN	347		[NR]
162	Dwarsdijk 8	3945LC	COTHEN	351	o.a.	[NR]
163	Graaf van Lynden van Sandenburgweg 31	3945PA	COTHEN	353		[NR]
164	Rivium Boulevard 301	2909LK	CAPELLE AD YSSEL	354		[NR]
165	Ossenwaard 13A	3945PG	COTHEN	359	o.a.	[RD]
166	Ossenwaard 18	3945PG	COTHEN	360		[RP]
167	Ossenwaard 6	3945PG	COTHEN	361	o.a.	[RD]
168	Agaatlaan 39	3523CP	UTRECHT	364		[NR]
169	Landscheidingsweg 11	3962RC	WYK BY DUURSTEDE	365	o.a.	[NR]
170	Graaf van Lynden van Sandenburgweg 6	3962RB	WIJK BIJ DUURSTEDE	370	o.a.	[NR]
171	Willem Alexanderweg 63	3945CH	COTHEN	373		[NR]
172	Graaf van Lynden van Sandenburgweg 27	3945PA	COTHEN	380	o.a.	[NR]
173	Van de Geerstraat 3	4021BX	MAURIK	384	o.a.	[NR]
174	Kampweg 2	3981EX	BUNNIK	385	o.a.	[NR]
175	Beneluxlaan 9	3527HS	UTRECHT	386	o.a.	[NR]
176	Rijnzichtlaan 52	3981BV	BUNNIK	390		[NR]
177	Dennenweg 2	3735MR	BOSCH EN DUIN	391		[NR]
178	Koning Willem III straat 4	3981BX	BUNNIK	392		[RD]
179	Koning Willem III straat 8	3981BX	BUNNIK	393		[NR]
180	Krommerijnstraat 1	3981EW	BUNNIK	395		[NR]
181	Prinses Beatrixstraat 39	3981BH	BUNNIK	396		[NR]
182	2e Berkendijk 10	7255PD	HENGELO GLD	397		[RP]
183	Koningin Emmastraat 68	3981VC	BUNNIK	398		[NR]
184	Koningin Emmastraat 70	3981VC	BUNNIK	399		[NR]
185	Koningin Emmastraat 72	3981VC	BUNNIK	400		[RD]
186	Prinses Beatrixstraat 29	3981BG	BUNNIK	401		[RD]
187	Koning Willem III straat 11	3981BW	BUNNIK	403		[RD]
188	Koning Willem III straat 9	3981BW	BUNNIK	404		[RP]
189	Koning Willem III straat 3	3981BW	BUNNIK	406		[RD]
190	Koning Willem III straat 1A	3981BW	BUNNIK	407	o.a.	[RD]
191	Koning Willem III straat 1	3981BW	BUNNIK	408		[RD]
192	Moreelsepark 3	3511EP	UTRECHT	410	o.a.	[NR]
193	Burgemeester Meslaan 49	4003CA	TIEL	411	o.a.	[NR]
194	Schoudermantel 57A	3981AG	BUNNIK	412	o.a.	[RD]
195	Schoudermantel 52	3981AH	BUNNIK	414	o.a.	[NR]
196	Korte Voorhout 7	2511CW	S GRAVENHAGE	416	o.a.	[NR]
197	Winschoterdiep 60	9723AB	GRONINGEN	419		[NR]
198	Langstraat 45	3981ET	BUNNIK	420	o.a.	[RD]
199	Kampweg 10	3981EX	BUNNIK	422		[RP]
200	Kampweg 8	3981EX	BUNNIK	423		[RD]
201	Schoudermantel 56	3981AH	BUNNIK	424	o.a.	[NR]
202	Schoudermantel 58	3981AH	BUNNIK	425	o.a.	[NR]
203	Langstraat 31	3981ET	BUNNIK	426		[NR]
204	Langstraat 35	3981ET	BUNNIK	430	o.a.	[NR]
205	Stadsplateau 1	3521AZ	UTRECHT	432	o.a.	[NR]
206	Schoudermantel 47	3981AG	BUNNIK	433	o.a.	[RD]
207	Kloosterbrink 41	8034PT	ZWOLLE	435	o.a.	[NR]
208	Provincialeweg 92	3981AS	BUNNIK	436		[NR]
209	Prinses Beatrixstraat 31	3981BG	BUNNIK	439		[NR]
210	Schoudermantel 59	3981AG	BUNNIK	441		[NR]
211	Sportlaan 2	3981HP	BUNNIK	442	o.a.	[RD]
212	Schoudermantel 45	3981AG	BUNNIK	444		[NR]
213	Rumpsterweg 15	3981AK	BUNNIK	445	o.a.	[NR]
214	Prinses Beatrixstraat 19	3981BG	BUNNIK	446		[RD]
215	Prinses Beatrixstraat 21	3981BG	BUNNIK	447		[RD]

Case	Street	Postcode	Municipality	Location		Response
216	Prinses Beatrixstraat 23	3981BG	BUNNIK	448		[RD]
217	Prinses Beatrixstraat 35	3981BH	BUNNIK	449		[RP]
218	Schoudermantel 79	3981AG	BUNNIK	451	o.a.	[RD]
219	Koningin Emmastraat 31	3981VA	BUNNIK	453		[RD]
220	Koningin Emmastraat 29	3981VA	BUNNIK	454		[RD]
221	Koning Willem III straat 12	3981BX	BUNNIK	455		[NR]
222	Koning Willem III straat 10	3981BX	BUNNIK	456		[RD]
223	Prins Hendrikstr 8	3981VE	BUNNIK	457		[NR]
224	Rijnsoever 1	3981HJ	BUNNIK	458	o.a.	[NR]
225	Het Rond 1	3701HS	ZEIST	462	o.a.	[RD]
226	Langstraat 86	3981EV	BUNNIK	463	o.a.	[RD]
227	Langstraat 84	3981EV	BUNNIK	464	o.a.	[RP]
228	Langstraat 82	3981EV	BUNNIK	465	o.a.	[RD]
229	Prinses Beatrixstraat 28	3981BK	BUNNIK	471		[RD]
230	Prinses Beatrixstraat 30	3981BK	BUNNIK	472		[NR]
231	Kampweg 6	3981EX	BUNNIK	475		[RD]
232	Dorpsstraat 1	3981EA	BUNNIK	477		[NR]
233	Schoudermantel 73	3981AG	BUNNIK	486		[NR]
234	Schoudermantel 75	3981AG	BUNNIK	487		[NR]
235	Schoudermantel 77	3981AG	BUNNIK	488		[RP]
236	Prinses Beatrixstraat 22	3981BJ	BUNNIK	491		[NR]
237	Prinses Beatrixstraat 20	3981BJ	BUNNIK	492		[RD]
238	Koningin Wilheminastraat 20	3981VG	BUNNIK	493		[NR]
239	Koning Willem III straat 6	3981BX	BUNNIK	494		[NR]
240	Prinses Beatrixstraat 17	3981BG	BUNNIK	496		[RP]
241	Prinses Beatrixstraat 15	3981BG	BUNNIK	497		[NR]
242	Prinses Beatrixstraat 13	3981BG	BUNNIK	498		[RD]
243	Prinses Beatrixstraat 11	3981BG	BUNNIK	499		[RP]
244	Prinses Beatrixstraat 10	3981BJ	BUNNIK	500		[RP]
245	Prinses Beatrixstraat 12	3981BJ	BUNNIK	501		[RD]
246	Prinses Beatrixstraat 14	3981BJ	BUNNIK	502		[NR]
247	Prinses Beatrixstraat 25	3981BG	BUNNIK	503		[I]
248	Prinses Beatrixstraat 18	3981BJ	BUNNIK	504		[RP]
249	Rumpsterweg 8	3981AK	BUNNIK	505	o.a.	[NR]
250	Koningin Julianalaan 52	3981BC	BUNNIK	506		[RD]
251	Pins Bernhardstraat 51	3981BM	BUNNIK	507		[RD]
252	Hessenweg 189A	3791PG	ACHTERVELD	508		[NR]
253	Stationshal 17	3511CE	UTRECHT	509		[NR]
254	Prinses Beatrixstraat 37	3981BH	BUNNIK	510		[RD]
255	Havenkade 2	3281LS	NUMANSDORP	512	o.a.	[NR]
256	Camminghalaan 32A	3981GH	BUNNIK	515	o.a.	[RD]
257	Koningslaan 7	3981HD	BUNNIK	528	o.a.	[NR]
258	Koningslaan 7A	3981HD	BUNNIK	530	o.a.	[NR]
259	Dorpsstraat1C	3981EA	BUNNIK	537		[RD]
260	Koningin Emmastraat 74	3981VC	BUNNIK	548		[RD]
261	Koningin Emmastraat 76	3981VC	BUNNIK	549		[NR]
262	Beleverderelaan 3	8072DE	NUNSPEET	556		[NR]
263	Singel 38	3984NZ	ODYK	561		[NR]
264	Dorpsstraat 1	3981EA	BUNNIK	568		[NR]
265	Dorpsstraat 1D	3981EA	BUNNIK	569		[RD]
266	Dorpsstraat 1E	3981EA	BUNNIK	570		[RP]
267	Wethouder Hollaan 3	3984KA	ODYK	571		[NR]
268	Prinses Beatrixstraat 26	3981BK	BUNNIK	572		[NR]
269	Nieuwe Uitleg 16	2514BP	S GRAVENHAGE	575	o.a.	[RP]
270	Camminghalaan 32	3981GH	BUNNIK	582	o.a.	[RD]
271	Jodichemdreef 24	3984JT	ODYK	583		[RD]
272	Hoefijzerlaan 25	3981GK	BUNNIK	584		[NR]
273	Hoefijzerlaan 33	3981GL	BUNNIK	587	o.a.	[RD]
274	Rosariumlaan 43	3972GG	DRIEBERGEN RYSENB	592	o.a.	[NR]
275	Koningsweg 87	3582GC	UTRECHT	595		[NR]
276	Zeisterweg 103	3984NK	ODYK	605	o.a.	[RD]
277	Werdorperwaard 9	3984PR	ODYK	606		[RP]
278	Werdorperwaard 11	3984PR	ODYK	607		[RD]
279	Werdorperwaard 13	3984PR	ODYK	608	o.a.	[RP]
280	Werdorperwaard 15	3984PR	ODYK	609		[RP]
281	Werdorperwaard 19	3984PR	ODYK	611	o.a.	[RD]
282	Schoudermantel 85	3984SR	ODYK	619	o.a.	[RD]
283	Schoudermantel 81	3984SR	ODYK	620		[I]
284	Willem van Kouwenerf 8	3981KH	BUNNIK	621		[RD]
285	Willem van Kouwenerf 4	3981KH	BUNNIK	623		[RD]
286	Swinsedreef 11	3235AR	ROCKANJE	624		[NR]
287	H Lampad 6	3981KG	BUNNIK	625		[RP]
288	H Lampad 4	3981KG	BUNNIK	626		[NR]

Case	Street	Postcode	Municipality	Location		Response
289	H Lampad 2	3981KG	BUNNIK	627	o.a.	[RD]
290	Vierhoeverwaard 9	3984PP	ODYK	629		[I]
291	Vierhoeverwaard 7	3984PP	ODYK	631		[NR]
292	Vierhoeverwaard 6	3984PP	ODYK	632		[RD]
293	Vierhoeverwaard 5	3984PP	ODYK	633		[NR]
294	Vierhoeverwaard 4	3984PP	ODYK	634		[RD]
295	Alendorperweg 48	3451GN	VLEUTEN	635		[NR]
296	Langstraat 33	3981ET	BUNNIK	638		[RD]
297	Zeisterweg 93	3984NK	ODYK	645		[RP]
298	Rijnseweg 4	3984NG	ODYK	648	o.a.	[RP]
299	Provincialeweg 32A	3981AP	BUNNIK	650		[NR]
300	Kerkpad 1	3981EM	BUNNIK	651		[NR]
301	Transistorstraat 71D	1322CK	ALMERE	652	o.a.	[NR]
302	A van Lutzenbruglaan 10	3972WZ	DRIEBERGEN RYSENB	653		[NR]
303	Van Merkensteijngaarde 11	3981XL	BUNNIK	654		[NR]
304	Lindenlaan 12	3707ER	ZEIST	655		[NR]
305	Fruitweg 56	3981PA	BUNNIK	656	o.a.	[NR]
306	Vierhoeverwaard 3	3984PP	ODYK	657		[RP]
307	B. Dolywaard 9	3984PN	ODYK	658		[RD]
308	B. Dolywaard 7	3984PN	ODYK	660		[RD]
309	B. Dolywaard 6	3984PN	ODYK	661		[RP]
310	B. Dolywaard 3	3984PN	ODYK	662		[NR]
311	B. Dolywaard 4	3984PN	ODYK	663		[RD]
312	B. Dolywaard 5	3984PN	ODYK	664		[I]
313	Koning Willem III straat 7A	3981BW	BUNNIK	665		[RD]
314	Koning Willem III straat 7B	3981BW	BUNNIK	666		[RD]
315	Camminghalaan 32	3981GH	BUNNIK	668		[NR]
316	D. Martoplein 3	3703DC	ZEIST	669	o.a.	[NR]
317	Eekhoornlaan 4	3951AV	MAARN	671	o.a.	[NR]
318	Malibaan 11	3581CA	UTRECHT	674		[NR]
319	Rijnseweg 3	3984NG	ODYK	682		[RP]
320	Rijnseweg 1	3984NG	ODYK	687		[NR]
321	Rijnseweg 2	3984NG	ODYK	688		[RD]
322	Rumpsterweg 7	3981AK	BUNNIK	689		[NR]
323	Helling 3	3523CB	UTRECHT	712		[NR]
324	Meidoorn 4	3984AM	ODYK	718		[NR]
325	Fruitweg 54	3981PA	BUNNIK	722		[RD]
326	Vlietland 45	3271VE	MYNSHEERENLAND	726		[NR]
327	Sportlaan 2	3981HP	BUNNIK	732		[NR]
328	Prinses Beatrixstraat 33	3981BH	BUNNIK	742		[RD]
329	Prinses Beatrixstraat 27	3981BG	BUNNIK	743		[RP]
330	Pinses Margrietstraat 11	3981BE	BUNNIK	744		[RP]
331	Koningin Julianalaan 17	3981BA	BUNNIK	745		[RP]
332	Langstraat 37	3981ET	BUNNIK	753		[RD]
333	Langstraat 41	3981ET	BUNNIK	754		[RP]
334	Langstraat 43	3981ET	BUNNIK	755		[NR]
335	Langstraat 39	3981ET	BUNNIK	756		[RD]
336	Prinses Beatrixstraat 24	3981BJ	BUNNIK	758		[RD]
337	Naritaweg 221	1043CB	AMSTERDAM	759		[NR]
338	Kampweg 4	3981EX	BUNNIK	769		[RP]
339	Ambachtspad 16	3945BG	COTHEN	774	o.a.	[RD]
340	Provincialeweg 92	3981AS	BUNNIK	776		[RD]
341	Kerkweg 30	3945BN	COTHEN	778	o.a.	[NR]
342	Kerkdwarsweg 3	3945BP	COTHEN	779	o.a.	[RD]
343	Kerkweg 28	3945BN	COTHEN	782		[NR]
344	Kerkweg 26	3945BN	COTHEN	783		[NR]
345	Slotlaan 60	3701GN	ZEIST	794		[NR]
346	Vierhoeverwaard 10	3984PP	ODYK	795	o.a.	[RD]
347	In de Bogerd 6	3945BH	COTHEN	797		[RD]
348	Gooyerdijk 43	3947NB	LANGBROEK	798		[NR]
349	Dorpsstraat 18	3945BL	COTHEN	799		[NR]
350	Dorpsstraat 16	3945BL	COTHEN	800		[RP]
351	Dorpsstraat 10	3945BL	COTHEN	801		[NR]
352	Zeisterweg 91	3984NK	ODYK	804		[RD]
353	Zeisterweg 95	3984NK	ODYK	806		[RD]
354	Rijnseweg 6	3984NG	ODYK	808	o.a.	[RD]
355	Rijnseweg 8	3984NG	ODYK	809	o.a.	[RD]
356	Rijnseweg 10	3984NG	ODYK	812		[RD]
357	Rijnseweg 12	3984NG	ODYK	813		[RP]
358	Herenstraat 60	3985RW	WERKHOVEN	814		[NR]
359	Schoudermantel 54	3981AH	BUNNIK	817	o.a.	[NR]
360	Rijnseweide 14	3945BR	COTHEN	823		[RD]
361	Rijnseweide 12	3945BR	COTHEN	824		[RD]

Case	Street	Postcode	Municipality	Location		Response
362	Rijnseweide 26	3945BR	COTHEN	825	o.a.	[NR]
363	Kerkweg 38	3945BN	COTHEN	826	o.a.	[NR]
364	Kerkweg 10	3945BN	COTHEN	827	o.a.	[NR]
365	Kerkweg 8	3945BN	COTHEN	828	o.a.	[NR]
366	Ambachtspad 18	3945BG	COTHEN	829		[NR]
367	Distelakkerstraat 2	6641KC	BEUNINGEN GLD	830		[NR]
368	Kerkweg 6	3945BN	COTHEN	831		[NR]
369	Kerkweg 4	3945BN	COTHEN	832		[RP]
370	Graaf van Lynden van Sandenburgweg 19	3945PA	COTHEN	834	o.a.	[NR]
371	Kerkdwarsweg 9	3945BP	COTHEN	836	o.a.	[NR]
372	Ossenwaard 11	3945PG	COTHEN	839		[RD]
373	Sterrenberglaan 6	3712XA	HUIS TER HEIDE UT	842		[NR]
374	Kerkweg 36	3945BN	COTHEN	859		[NR]
375	Kerkdwarsweg 21	3945BP	COTHEN	860		[RD]
376	Kerkdwarsweg 11	3945BP	COTHEN	861	o.a.	[NR]
377	Werdorperwaard 21	3984PR	ODYK	874	o.a.	[RP]
378	Werdorperwaard 23	3984PR	ODYK	875		[RP]
379	De Brink 8	3945BE	COTHEN	880		[RP]
380	Dorpsstraat 53	3945BK	COTHEN	881	o.a.	[NR]
381	Graaf van Lynden van Sandenburgweg 13	3945PA	COTHEN	882		[NR]
382	Graaf van Lynden van Sandenburgweg 9	3945PA	COTHEN	883		[NR]
383	Graaf van Lynden van Sandenburgweg 7	3945PA	COTHEN	884		[NR]
384	Kerkweg 24	3945BN	COTHEN	885	o.a.	[RP]
385	Kerkweg 16	3945BN	COTHEN	887	o.a.	[NR]
386	Kerkweg 14	3945BN	COTHEN	888	o.a.	[NR]
387	Ossenwaard 19	3945PG	COTHEN	889		[RD]
388	Dorpsstraat 1B	3981EA	BUNNIK	891		[RD]
389	Ossenwaard 18	3945PG	COTHEN	892	o.a.	[RP]
390	Appelakker 17	3945EE	COTHEN	897	o.a.	[NR]
391	Kerkweg 3A	3945BM	COTHEN	901		[RD]
392	Kerkweg 3	3945BM	COTHEN	902		[NR]
393	Kerkweg 1A	3945BM	COTHEN	903		[RP]
394	Kerkweg 1	3945BM	COTHEN	904		[NR]
395	Dorpsstraat 51	3945BK	COTHEN	905	o.a.	[NR]
396	Dorpsstraat 49	3945BK	COTHEN	910	o.a.	[NR]
397	Graaf van Lynden van Sandenburgweg 17	3945PA	COTHEN	915		[RP]
398	Graaf van Lynden van Sandenburgweg 15	3945PA	COTHEN	916	o.a.	[NR]
399	Zandpad 1A	3945BA	COTHEN	918	o.a.	[NR]
400	Dorpsstraat 14	3945BL	COTHEN	920		[NR]
401	Zandpad 3	3945BA	COTHEN	927	o.a.	[RP]
402	Groenewoudenseweg 1	3945BB	COTHEN	930		[NR]
403	Ossenwaard 16	3945PG	COTHEN	936	o.a.	[RD]
404	Ambachtspad 20	3945BG	COTHEN	938	o.a.	[NR]
405	Kerkdwarsweg 19	3945BP	COTHEN	945	o.a.	[NR]
406	Kerkdwarsweg 15	3945BP	COTHEN	947	o.a.	[NR]
407	Ambachtspad 14	3945BG	COTHEN	948		[NR]
408	Dorpsstraat 47	3945BK	COTHEN	953		[NR]
409	De Brink 7	3945BE	COTHEN	956		[RP]
410	Zandpad 3	3945BA	COTHEN	957		[NR]
411	Zandpad 7	3945BA	COTHEN	958		[NR]
412	Kruisboog 32	3961LG	WYK BY DUURSTEDE	959	o.a.	[NR]
413	Rijnseweide 24	3945BR	COTHEN	965		[RP]
414	Rijnseweide 22	3945BR	COTHEN	966		[NR]
415	Rijnseweide 20	3945BR	COTHEN	967		[RD]
416	Rijnseweide 18	3945BR	COTHEN	968		[RP]
417	Rijnseweide 16	3945BR	COTHEN	969		[RD]
418	Ambachtspad 10	3945BG	COTHEN	971	o.a.	[NR]
419	Ambachtspad 8	3945BG	COTHEN	972		[RP]
420	Dorpsstraat 34	3945BL	COTHEN	975		[RD]
421	Ambachtspad 26	3945BG	COTHEN	976		[RP]
422	Ambachtspad 24	3945BG	COTHEN	977		[RD]
423	Ambachtspad 22	3945BG	COTHEN	978		[I]
424	Ambachtspad 12	3945BG	COTHEN	979		[NR]
425	In de Bogerd 4	3945BH	COTHEN	982		[NR]
426	Graaf van Lynden van Sandenburgweg 5	3945PA	COTHEN	983		[RP]
427	Kerkweg 34	3945BN	COTHEN	984		[I]
428	Kerkweg 32	3945BN	COTHEN	985		[RD]
429	Hondsroos 4	4007TJ	TIEL	987		[NR]
430	Kerkweg 18A	3945BN	COTHEN	988		[NR]
431	Kerkweg 18	3945BN	COTHEN	989		[NR]
432	Dorpsstraat 55	3945BK	COTHEN	990	o.a.	[NR]
433	Kerkweg 22	3945BN	COTHEN	999		[RP]
434	Scherperburgerwaard 4	3984PB	ODYK	1010		[RP]

Case	Street	Postcode	Municipality	Location		Response
435	Scherperburgerwaard 2	3984PB	ODYK	1011		[RD]
436	Rosariumlaan43	3972GG	DRIEBERGEN RYSENB	1012		[NR]
437	Gildenring 45	3981JJ	BUNNIK	1015		[NR]
438	Weteringerwaard 3	3984PC	ODYK	1016		[NR]
439	Vlowijkerwaard 2	3984PD	ODYK	1017	o.a.	[NR]
440	Vlowijkerwaard 1	3984PD	ODYK	1018		[RD]
441	Singel14	3984NZ	ODYK	1019		[NR]
442	Singel 10	3984NZ	ODYK	1020		[RD]
443	Scherpenburgerweg 3	3984PB	ODYK	1022		[RP]
444	Weteringerwaard 5	3984PC	ODYK	1023		[RD]
445	Weteringerwaard 4	3984PC	ODYK	1024		[RD]
446	Vlowijkerwaard 3	3984PD	ODYK	1025	o.a.	[RD]
447	Singel 16	3984NZ	ODYK	1026		[RD]
448	Singel 12	3984NZ	ODYK	1027		[NR]
449	Singel 8	3984NZ	ODYK	1028		[RD]
450	Weteringerwaard 7	3984PC	ODYK	1032		[NR]
451	Snoeksloot 20	3993HL	HOUTEN	1037		[NR]
452	Scherperburgerwaard 7	3984PB	ODYK	1038		[NR]
453	D. Scherperburgerweg 6	3984PB	ODYK	1039		[RP]
454	Vlowijkerwaard 4	3984PD	ODYK	1040		[NR]
455	Weteringerwaard 6	3984PC	ODYK	1041		[RP]
456	Heidelberglaam 8	3584CS	UTRECHT	1054		[I]
457	Langbroekseweg 2	3962EH	WYK BY DUURSTEDE	1059		[RD]
458	Langbroekseweg 4	3962EH	WYK BY DUURSTEDE	1060		[RD]

Legend

[RP]	Respons by postcard survey
[RD]	Respons trough door-to-door survey
[I]	Invalid response
[NR]	Non respons

o.a The selected actor has more than 1 land plot within the demarcated sample area.

Appx.D The Data Set
Kromme Rijn 50m 30 december 2016

Case	Zoning	Rationalities	Incentive
3	[Wo]	[1]	[C]
4	[Wo]	[1] [6] [8] [17] [28]	[K]
5	[Wo]	[1] [17] [21] [26] [28] [30] [38]	[C]
6	[Wo]	[1] [12] [24] [30]	[K]
7	[Wo]	[4] [12] [17] [34]	[C]
9	[Wo]	[9] [12] [13] [17] [20] [21] [24] [37]	[J]
11	[Wo]	[1] [2] [6] [15] [21] [30]	[E]
16	[Re]	[16] [17] [26] [27] [28] [30] [35] [40]	[F]
18	[Wo]	[2] [6] [24]	[J]
20	[Wo]	[11] [16] [21] [24] [28] [30]	[F]
21	[Bd]	[4] [5] [8] [22] [30] [38]	[D]
22	[Wo]	[19] [21] [28] [30]	[J]
24	[Wa]	[28] [35] [39] [40]	[G]
25	[Ag]	[32]	[A]
26	[Wo]	[30] [35] [40]	[I]
27	[Wo]	[21] [24] [28] [30]	[E]
29	[Wo]	[28] [30] [35]	[C]
30	[Wo]	[30] [35] [39]	[C]
33	[Ag]	[16] [17]	[J]
38	[Na]	[4] [5] [8] [28]	[K]
39	[An]	[12] [13] [18] [24] [28]	[C]
42	[Re]	[15] [28] [30]	[C]
43	[Wo]	[14] [17] [19] [26] [36] [39]	[F]
44	[Wo]	[30]	[C]
47	[An]	[16] [21] [27] [30]	[K]
49	[Wo]	[11] [13] [15] [16] [19] [21] [26] [30] [38]	[C]
50	[Wo]	[28] [30] [38]	[J]
51	[Ag]	[1]	[D]
52	[Wo]	[28] [30] [35] [39] [40]	[E]
53	[Wo]	[39]	[D]
55	[Wo]	[13] [15] [16] [21] [28] [40]	[C]
61	[Wo]	[40]	[E]
66	[Wo]	[11] [16] [17] [28] [35] [40]	[K]
67	[Wo]	[21] [28] [30] [40]	[E]
70	[Wo]	[11] [13] [21] [24] [28] [37]	[C]
71	[Wo]	[21] [28]	[C]
72	[Wo]	[21] [28] [30]	[E]
75	[Wo]	[28] [35] [40]	[A]
77	[Wo]	[16] [18] [21] [35]	[C]
79	[Wo]	[11] [16] [19] [21] [28] [29] [30] [34] [40]	[A]
82	[Wo]	[13] [24] [30] [40]	[F]
85	[Wo]	[30]	[J]
86	[Wo]	[28] [30]	[D]
87	[Wo]	[13] [17] [21] [28] [30] [34] [40]	[G]
88	[Wo]	[12] [18] [23] [25] [28] [30]	[E]
96	[Wo]	[30]	[C]
99	[Gm]	[30] [31] [34] [40]	[G]
100	[Wo]	[21] [26] [28] [30] [34] [40]	[J]
101	[Wo]	[2]	[K]
102	[Wo]	[21] [28] [30] [34]	[E]
103	[Wo]	[1]	[C]
106	[Wo]	[7] [8]	[L]
108	[Wo]	[2] [13] [24] [30] [40]	[J]
109	[Wo]	[21] [28] [30] [35] [38]	[C]
114	[Wo]	[1] [5] [21] [28] [30]	[K]
116	[Bd]	[13]	[D]
118	[Ag]	[12] [18] [24]	[C]
122	[Wo]	[3] [15] [21] [23] [24] [30]	[C]
127	[Wo]	[3] [5] [6] [11] [21] [28]	[J]
129	[Wo]	[3] [5] [13] [17] [18] [19] [28] [30] [35] [40]	[F]
131	[Ag]	[28] [30] [40]	[E]
136	[Wo]	[2] [6] [12] [30]	[H]
138	[Wo]	[21] [23] [26] [28] [30] [35]	[C]
139	[Wo]	[4] [5] [21] [28] [30] [32] [34]	[F]
140	[Wo]	[28] [30] [40]	[C]
141	[Wo]	[40]	[D]

Case	Zoning	Rationalities	Incentive
143	[Wo]	[5] [12] [13] [18] [19] [22] [28] [30] [38] [39]	[E]
144	[Ag]	[2] [8] [12] [24]	[K]
145	[Wo]	[8] [25] [30] [40]	[D]
146	[Wo]	[18] [19] [24] [26] [28] [30]	[K]
147	[Wo]	[15] [28] [30]	[C]
149	[Wo]	[21] [28] [30] [32]	[E]
151	[Wo]	[1] [11] [14] [16] [19] [30] [32] [34] [38]	[K]
159	[Gm]	[5]	[A]
165	[Wo]	[28] [30] [35] [39] [40]	[F]
166	[Wo]	[5] [6] [38]	[J]
167	[Ag]	[6]	[C]
178	[An]	[21] [26] [28] [30]	[F]
182	[Wo]	[21] [28] [30]	[J]
185	[Ag]	[2] [8] [9]	[K]
186	[Wo]	[21] [30] [34]	[F]
187	[Ag]	[11] [13] [15] [16] [35]	[I]
188	[Wo]	[11] [21] [28] [30] [38] [39]	[A]
189	[Wo]	[16] [26] [30]	[E]
190	[Bd]	[2] [11] [13] [15] [17] [20] [24] [28] [30]	[E]
191	[Wo]	[26] [28] [30]	[E]
194	[Wo]	[28] [30] [40]	[A]
198	[Wo]	[12] [26] [28]	[E]
199	[Wo]	[1] [2] [4] [5] [6] [8] [9] [11] [12] [24]	[L]
200	[Wo]	[16] [21] [30] [40]	[C]
206	[Wo]	[16] [30] [38] [40]	[C]
211	[Wo]	[13] [17] [21] [26] [30] [32] [38]	[F]
214	[Wo]	[11] [28] [30] [38]	[A]
215	[Wo]	[40]	[F]
216	[Ag]	[2] [6] [8] [9]	[J]
217	[Wo]	[30]	[A]
218	[Bd]	[19] [22] [24] [30] [35] [38] [39] [40]	[F]
219	[Wo]	[4] [5] [12] [30]	[L]
220	[Wo]	[2] [8] [24] [34]	[K]
222	[Wo]	[21] [36] [40]	[F]
225	[Wo]	[28] [30]	[A]
226	[Wo]	[15]	[A]
227	[Wo]	[8] [12] [18] [28] [30] [35] [37] [38] [39] [40]	[G]
228	[Wo]	[21] [30] [35]	[D]
229	[Vk]	[16] [28] [30] [35] [38] [39] [40]	[C]
231	[Wo]	[21] [28] [30]	[E]
235	[Wo]	[3] [4] [5] [8] [28] [30] [35] [40]	[J]
237	[Wo]	[16] [17] [21] [28] [30] [38] [40]	[C]
240	[Wo]	[2] [5] [6] [12] [18] [21] [24] [38]	[J]
242	[Wo]	[22]	[A]
243	[Wo]	[28]	[C]
244	[Wo]	[30] [39] [40]	[A]
245	[Wo]	[2] [8] [9] [24] [28]	[A]
248	[Wo]	[21] [26] [28] [30] [35]	[F]
250	[Wo]	[16] [18] [21] [24] [30] [35]	[E]
251	[Wo]	[1] [4] [8] [26] [28] [31] [37]	[K]
254	[Wo]	[1] [4] [5] [21] [30]	[F]
256	[Wo]	[16] [24]	[C]
259	[Wo]	[16] [30]	[A]
260	[An]	[1] [4] [8] [28] [30]	[I]
265	[Wo]	[16] [26] [27] [28] [30] [35] [40]	[C]
266	[Wo]	[12] [18] [19] [22] [30] [35]	[E]
269	[Wo]	[28] [30]	[J]
270	[Wo]	[14] [16] [21] [28] [30]	[C]
271	[Wo]	[1] [31] [34]	[I]
273	[Ag]	[5] [6] [8]	[G]
276	[Wo]	[3] [16] [21] [22] [30] [38]	[C]
277	[Wo]	[1] [4] [5] [18]	[C]
278	[Gm]	[16] [21] [28] [30] [38] [40]	[A]
279	[Gm]	[28] [30]	[F]
280	[Bo]	[12] [17] [18] [30]	[C]
281	[Wo]	[11] [12] [17] [21] [30]	[C]
282	[Wo]	[3] [6] [9]	[B]
284	[Wo]	[27] [29] [31]	[K]
285	[Wo]	[11] [12] [19] [21] [26] [27] [29] [34]	[C]
287	[Wo]	[17] [28] [30] [40]	[C]
289	[Wo]	[39]	[F]
291	[Wo]	[21] [28] [30] [40]	[D]
292	[Wo]	[12] [18] [26] [39]	[F]

Case	Zoning	Rationalities	Incentive
294	[Wo]	[21] [30] [38]	[C]
296	[Wo]	[40]	[K]
297	[Wo]	[26] [28] [30]	[C]
298	[Wo]	[13] [21] [26] [33] [38] [40]	[A]
306	[Wo]	[14] [21] [34] [39] [40]	[J]
307	[Wo]	[13] [18] [30]	[K]
308	[Wo]	[15] [21] [26] [30]	[E]
309	[Wo]	[6] [9] [10] [15] [30] [37]	[G]
311	[Wo]	[17] [19] [21] [28] [30] [40]	[F]
313	[Wo]	[21] [26] [28] [30] [40]	[F]
314	[Wo]	[13] [16] [17] [19] [21] [28] [30] [40]	[B]
319	[Wo]	[1] [2] [6] [9] [13]	[J]
321	[Wo]	[30]	[C]
325	[Wo]	[17] [21] [22] [27] [28] [30]	[F]
328	[Wo]	[21] [30] [32] [39] [40]	[J]
329	[Wo]	[39] [40]	[A]
330	[Wo]	[11] [21] [28] [30] [40]	[E]
331	[Bd]	[11] [13] [16] [17] [19] [30] [40]	[E]
332	[Wo]	[21] [28] [30]	[F]
333	[Wo]	[24] [30] [35]	[J]
335	[Wo]	[12] [21] [26] [28] [30]	[K]
336	[Wo]	[11] [16] [17] [19] [28] [30]	[C]
338	[Wo]	[1] [5] [11] [34]	[J]
339	[Wo]	[13] [21] [30]	[A]
340	[Wo]	[14] [16] [17] [18] [19] [25] [28] [30] [38] [40]	[D]
342	[Wo]	[19]	[C]
346	[Wo]	[17] [32] [35] [40]	[E]
347	[Wo]	[28] [31] [34] [35] [40]	[C]
350	[Wo]	[10]	[A]
352	[Wo]	[21] [26] [30] [32] [34] [39] [40]	[C]
353	[Wo]	[11]	[A]
354	[Wo]	[17] [26] [27] [30] [39]	[F]
355	[Wo]	[6] [9]	[J]
356	[Wo]	[30]	[F]
357	[Wo]	[19] [30] [35] [39]	[J]
360	[Wo]	[1] [5] [10] [13] [20]	[G]
361	[Wo]	[20] [25] [31] [35] [40]	[J]
369	[Wo]	[21] [28] [30] [40]	[C]
372	[Wo]	[30]	[A]
375	[Ag]	[1] [6] [8] [9] [10] [18] [30] [36]	[A]
377	[Wo]	[1] [15] [21] [25] [30]	[D]
378	[Wo]	[1] [13] [28] [30] [32] [35] [39]	[J]
379	[Wo]	[28] [30] [34] [35] [39]	[K]
384	[Ag]	[39]	[J]
387	[Wo]	[18] [26] [30]	[D]
388	[Wo]	[27] [28]	[J]
389	[Wo]	[5] [6] [8]	[E]
391	[Gm]	[30] [39]	[A]
393	[Wo]	[28] [30]	[E]
397	[Wo]	[18] [21] [24] [28] [30]	[E]
401	[Wo]	[21]	[C]
403	[Wo]	[12] [18] [23] [24] [28] [39] [40]	[C]
407	[Wo]	[3] [6] [30]	[F]
409	[Wo]	[3] [27] [30] [38]	[L]
413	[Ag]	[13] [24] [28]	[D]
415	[Wo]	[3] [30] [35] [37] [40]	[F]
416	[Wo]	[21] [26] [27] [28] [30] [35] [40]	[A]
417	[Wo]	[21] [28] [30]	[K]
419	[Wo]	[39]	[C]
420	[Wo]	[16] [17] [24] [25] [26] [30]	[K]
421	[Wo]	[21] [30]	[K]
422	[Wo]	[21] [30]	[L]
425	[Wo]	[1] [27] [28] [30] [40]	[K]
428	[Wo]	[21] [23] [28] [29] [30] [34] [35] [39] [40]	[D]
433	[Wo]	[1]	[A]
434	[Wo]	[1] [5] [30]	[K]
435	[Wo]	[21] [30] [31]	[F]
440	[Wo]	[28]	[C]
442	[Wo]	[17] [27] [30] [32] [35] [38] [40]	[J]
443	[Wo]	[30]	[E]
444	[Wo]	[11] [15] [16] [30]	[C]
445	[Wo]	[21]	[E]
446	[Wo]	[11] [16] [19] [27] [28] [35] [39]	[C]

Case	Zoning	Rationalities	Incentive
447	[Wo]	[16] [25] [27] [28] [30]	[E]
449	[Wo]	[13] [30] [31] [32] [34] [39]	[C]
453	[Wo]	[16] [21] [30] [39]	[E]
455	[Wo]	[30]	[F]
457	[Wo]	[24] [35] [39] [40]	[E]
458	[Wo]	[11] [16] [30]	[E]

Legend (Zoning)

[Wo]	Wonen
[Ag]	Agrarisch
[An]	Agrarisch met natuurwaarden
[Gm]	Gemengd (lichte bedrijvigheid)
[Bo]	Bos
[Wa]	Water
[Bd]	Bedrijf
[Vk]	Verkeer
[Na]	Natuur
[Re]	Recreatie

Legend (Perceptions & perspectives; extracted by survey)

[1]	Perspective; Onbekend
[2]	Perspective; Achterdochtig
[3]	Perception; Ondergaan
[4]	Perception; Buitengesloten
[5]	Perspective; Ongeïnteresseerd
[6]	Perspective; Machteloos
[7]	Perspective; Onbetekenend
[8]	Perception; Niet gehoord
[9]	Perception; Oneerlijk
[10]	Perception; Ongeïnformeerd
[11]	Perception; Controle
[12]	Perspective; Risico
[13]	Perception; Regels
[14]	Perspective; Discipline
[15]	Perspective; Autoriteit
[16]	Perception; Expertise
[17]	Perception; Strategie
[18]	Perspective; Voorzichtigheid
[19]	Perception; Veiligheidsprogramma
[20]	Perspective; Strikt
[21]	Perception; Behoud
[22]	Perception; Voorkomen
[23]	Perspective; Fragiliteit
[24]	Perspective; Bezorgdheid
[25]	Perception; Sociaalgezind
[26]	Perspective; Waarden
[27]	Perception; (Onder)steunen
[28]	Perception; Omgeving
[29]	Perspective; Gelijkheid
[30]	Perception; Natuurbeheer
[31]	Perspective; Zelfbeschikking
[32]	Perception; Progressie
[33]	Perspective; Presteren
[34]	Perspective; Vrijheid
[35]	Perception; Kansen
[36]	Perspective; Grenzeloos
[37]	Perception; Commercieel
[38]	Perception; Technische-oplossingen
[39]	Perspective; Succes
[40]	Perception; Vooruitgang

Legend (Incentives; extracted by survey)

[A]	Hierarchic incentive; Degelijke uit voering
[B]	Hierarchic incentive;Robuust ontwerp
[C]	Hierarchic incentive;Gegarandeerd en goed onderhoud
[D]	Egalitarian incentive; Voorkomen van schade aan de omgeving
[E]	Egalitarian incentive; Terugbrengen van verlies van bestaande natuur/cultureel erfgoed
[F]	Egalitarian incentive; Bijdragen aan het verbeteren van de omgeving buurt
[G]	Individualistic incentive; Tegenprestaties
[H]	Individualistic incentive; Recht op exploitatie van de oever
[I]	Individualistic incentive; Grondruil
[J]	Fatalistic incentive; Betrokken worden bij het plan
[K]	Fatalistic incentive; Geïnformeerd worden
[L]	Fatalistic incentive; Hulp bij de herinrichting

Appx.E The Strategy
Based on HDSR project 431404; Oevers Middelweerd-Van Rooijen

The project was initiated from WFD-tasks in 2010, planned from 2011 to 2014 and implemented in 2015

Notification For the fact that this research project largely focused on the elaboration of the establishment of the for this research project developed *"Prism"*-concept, this report was almost entirely devoted to the explanation of the methodology and analysis of that conceptual model. To that extent this thesis-bundle is mainly written in the context of scientific relevance. In order to complete the project in practical terms, this specific appendix (E) deals with how the knowledge gained during this project can be translated into practice. For this purpose an example of how a *"Cooperation"*-strategy as proposed by this project, could be applied to a recent Water Framework Directive (WDF) project in the Kromme Rijn catchment area (2014). The aim of this appendix E is mainly to elaborate the matter of section 4.5 (paper 3) in an exemplary way. The example is build on the in that section given example archetypes. This final exercise of the research project should illustrate what the rather abstract *"Prism"*-concept implicates in a practical environment and it should demonstrates the social relevance of this research.

Introduction

Water board Hoogheemraadschap de Stichtse Rijnlanden (HDSR) is the legal institution that conducts the water management on the Kromme Rijn catchment area. Due to the cutting of benches, shredding of shore lines and removing natural vegetation on the riverbanks during the sixties and seventies of the last century, the ecological value of this river has reduced dramatically. Also non-local side water that is heavily enriched with nutrients, such as water from the canal *Langbroeker wetering* is supplied to the catchement. In addition, the growth of natural aquatic vegetation in the Kromme Rijn has been suppressed for many years by intensive cleaning management that was focused on a water quantity orientated approach of water management. For this the water quality, nature and landscape of the Kromme Rijn river was under pressure. However due to tasks laid down by the European Water Framework Directive (2000/60/EC) the water management policy of HDSR shifted form a quantity orientated approach towards a more quality-oriented approach of water management. In order to fulfill this European assignment, water board HDSR commissioned in 2008 engineering agency Royal Haskoning to the task of completing a spatial plan for the entire Kromme Rijn catchment. A plan that incorporates the Water Framework Directive (WFD) water quality requirements and additionally wishes for landscape, cultural history and recreation. On 24 November 2008, Royal Haskoning drew up an inventory of requirements and wishes from the members of different study groups regarding a future layout of the river and then formulated vision. This vision was then translated by Royal Haskoning into two sketches that together formed the spatial plan for the entire Kromme Rijn catchment area (figure E.2b).

Figure E.1. Project location in 2009

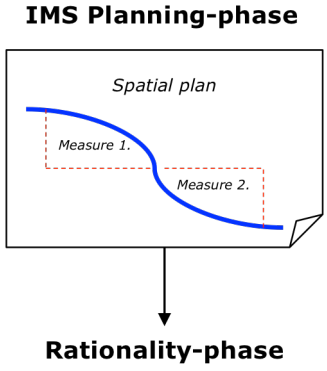

Figure E.2a.

Figure E.2b. Device image Kromme Rijn catchment South

Project 431404
HDSR project 431404 - *Oevers Middelweerd-Van Rooijen* serves in this appendix (E) as an example case for the *"Cooperation"*-strategy that was set out in section 4.5. This specific project has been chosen because the spatial layout of the planning area features great resemblance with the two elaborated archetypes; namely the Agrarian- and Residential archetype. In addition to that, the experiment performed for this research also came up with a division into two archetypes. And although the Non-residential archetype of the experiment (paragraph 4.3.1) was more general demarcated than just agricultural actors, for the sake of the example this archetype will be considered to be Agrarian. The developed area of this HDSR project (431404) is on the north side of the village of Cothen, which is one of the outlying villages of the Municipality of Wijk bij Duursteden. The project concerns one of the subprojects that were initiated from the visionary plan of Royal Haskoning. The project involved the construction of a 1) *Natural inundation land with a nature development target* (figure E.3, project location 14) and the development of a 2) *Natural shaped shoreline where the river has its free range* (figure E.3, project location 15). Strictly spoken from the zoning plan (figure E.4b) project location 14 does indeed include a function *"Nature"*, however, the location is bordered by a residential area and thus becomes subjected to a Residential archetype (figure E.4c, archetype 1). Although not backed up by experimental results project location 15 is further treated as an Agrarian archetype for reasons just mentioned.

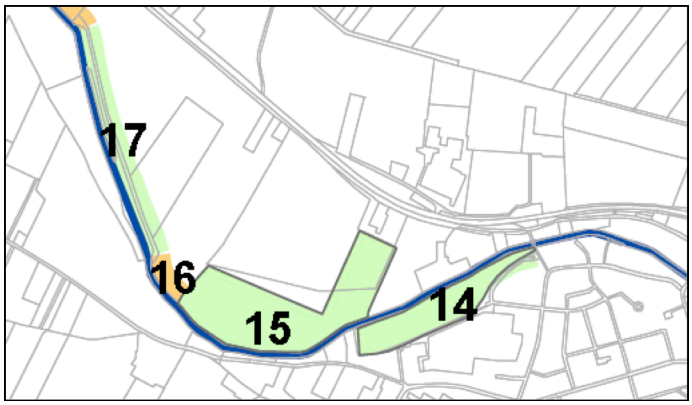

Figure E.3. Subproject locations

Cooperation strategy
The during this research project supposed Cooperation-strategy design is built around the three core insights gained during the project. Basically it comprises the three phases of the *"Prism"*-concept, namely: 1) *Rationality (demarcation)-phase*, 2) *Communication-phase*, and an 3) *Cooperation-phase*. And in order to complete the suggested strategy an additional 4) *Governance-phase* is introduced (figure 4.4). The following subparagraphs on these four phases describe the path of this strategy based on the (hypothetical) application of it during the actual HDSR WFD-project 431404.

Rationality-phase
During the fist phase of the strategy the planning area needs to be divided into the so-called archetypical zones. This exercise is performed based on the local zoning plan that is often laid down in a local act (figure E.4a). The zoning plan is an evident dividing medium for such a demarcations exercise because it comprehends a straightforward and guaranteed division of land-use functions. The influence of this legal division of functions on land-use has a major impact on the possibilities for using the land plots and thus the kind of actors that will settle in these zones (e.g. Barlowe, 1978). This Rationality-phase of the conceptual model (figure 2.4) is based on the insight that is gained by testing Hypothesis 1 (*"It's possible to classify types of actors (archetypes) based on the functions or land-uses of their plots, and generalize specific rationalities towards these archetypes").* Build on the results of the during this project performed experiment, the planning environment of the Kromme Rijn catchment would contain just two archetypes, namely: *Residentials* and *Non-residentials*. However it is expected that a less homogenous research population would have resulted into a more differentiated spectrum of archetypes (paragraph 4.3.1). In case of the area of the here elaborated *HDSR project 431403*, based on the prevailing local zoningplan[1] (figure E.4b), it would be plausible to have an archetype that contains *Agricultural entrepreneurs* who have a stake in their business management, because the measure planned on location 15 are allocated on a parcel that features an agricultural land-use function. For that reason the further elaboration of the supposed strategy considers a planning area that is demarcated into a 1) *Residential archetype* and an 2) *Agrarian archetype* (figure E.4c).

Cooperation-phase
The second phase of the here proposed cooperation strategy deepens the just performed demarcation exercise by determining rationalities that fit these two archetypes. As elaborated in paragraph 4.5.2 the reasoning behind this Cooperation-phase stems from the intellectual legacy of Cultural Theory (chapter 2/paper 1). The idea is that each archetype should feature to a high extent the same rationalities due to the fact they all are located on property that feature the same legal functions. Such legal functions determine the possibilities for using the property, and during this research project it has been stated that land-use has a relation to the rationality its actors will feature. The later statement is based on the assumption that the exploitation of that use will come with certain interests who are typical for that practice of that use (e.g. Schwarz & Thompson, 1990; Thompson et al., 1990; Douglas, 1999). The experimental part of this project was initially set up to backup the statement on that relation of land-use and rationality (by Hypothesis 2 and 3). So considering the Cooperation-phase for the planning area of HDSR project 431404, the rationalities of both the *Residential archetype* (1) and the *Agrarian archetype* (2) are taken into account by considering the perceptions and perspectives of these two archetypal actors.

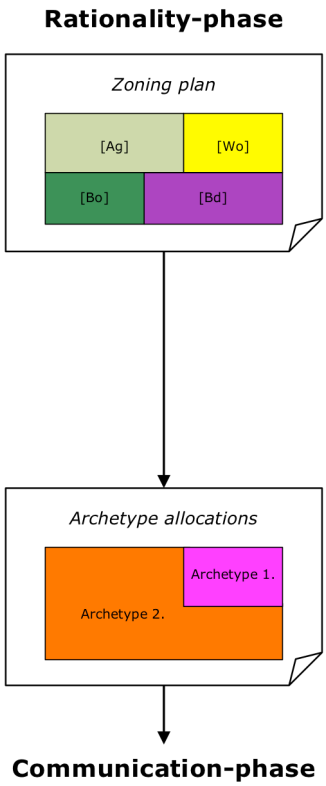

Figure E.4a.

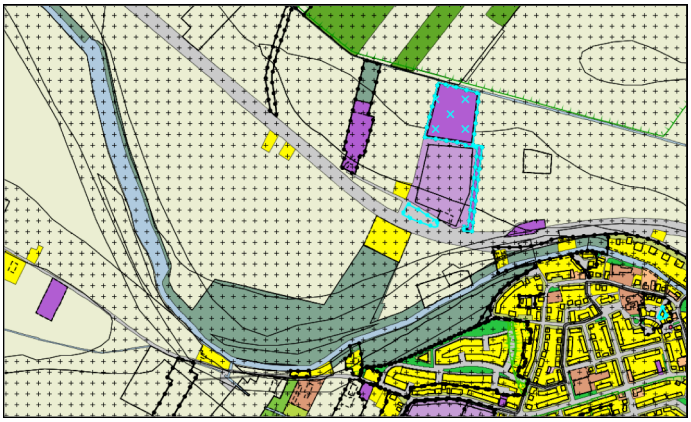

Figure E.4b. Zoning plan of the project location

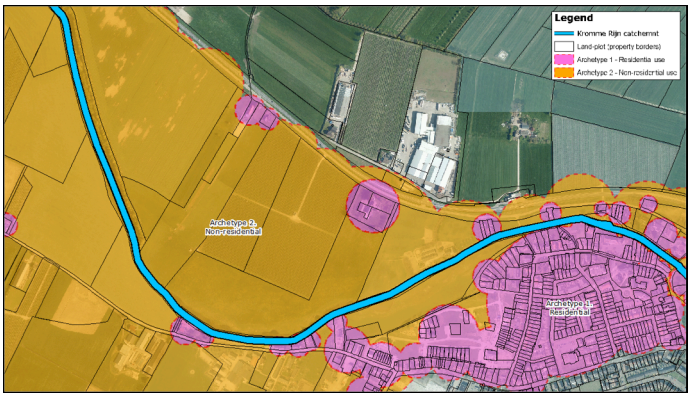

Figure E.4c. Spatial demarcation of archetypes

Considering the features of the two prevailing archetypes in the project area of HDSR project 431404, the following characteristics can be described. This description is build on both Cultural Theory – backed up by experimental results – as on local contextual variables:

Ad 1) Residential archetype: For the areas in where the Residential archetype is demarcated (figure E.4c, pink zones), during the experiment it has been found that this type of actor in particular takes on an *Egalitarian* rationality (paragraph 4.3.1). Taking Cultural Theory in to account, Egalitarians have a perception of fragile environmental circumstances. Following such a vision the environmental quality of it will react to any intervention what so ever. The perception that comes with this rationality features a high degree of collective control, and it rather stands for social equality. From this view (moral) responsibility are reasons for taking action (e.g. opposition); equality, democracy and community are high values for these kinds of actors (e.g. Schwarz & Thompson, 1990; Thompson et al., 1990; Douglas, 1999; Hartmann, 2012, p.247). So in that sense the for this HDSR project planned measures will be seen as a treat for the environmental condition on their living environment; the *Egalitarian* actor expects a negative outcome of the implementation. Regarding the process, rejection and deflection might be expected. Thus persuasion is a more appropriate approach. Cooperation might only be accepted if incentives like mitigation, compensation measures or environmental improvement are offered in return (e.g. Schwarz & Thompson, 1990, pp.66-67);

Ad 2) Agrarian archetype: For the areas in where the Agrarian archetype is demarcated (figure E.4c, orange zones), one may expect a more *Individualistic* based rationality. This expectation is made for the fact that due to its legal function only agricultural entrepreneurs will settle in that area. The intrinsic aim of this kind of actor is to engage in agricultural activities. Thus in terms of rationality these actors will focus their perceptions and perspectives on entrepreneurship. Reasoning from Cultural Theory, the individualistic perception on environmental circumstances of a development area is rather a resilient one. From this point of view an intervention will not cause any permanent damage to the spatial environment. Which implicates that any intervention can be legitimized. However, to the extent of perspectives self-determination and individual liberty are important values in an individualistic rationality. For planning this implicates that neoliberal schemes are the favorable approach, but experimental approaches are also welcome (Hartmann, 2012, p.247). Thus the individualistic actor features an opportunistic attitude. To that extent the implementation of measures are permissible with the addition that profitability may not be compromised. Regarding the here proposed cooperation strategy, an opportunistic and laissez faire approach will be the favorable mode of reasoning (Schwarz & Thompson, 1990, pp.66-67).

Cooperation-phase

In this third phase of the strategy incentives that should stimulate the actors to cooperate become formulated. This particular exercise covers the Cooperation-phase of the conceptual model (figure 2.4). In general terms an incentive comprises a quid pro quo in the form of a good or service that the initiator will issues to an actor for the sake of cooperation with the implementation of a measure. However whether those goods or services will truly stimulate the actor to cooperate depends on the fit of that incentive. In order to arrive at the right fit the initiator has to be aware of factors that influence such fit. During this research it is stated that the fit of an incentive is strongly associated with the rationality of an actor; a statement that was tested was by Hypothesis 4. However another important factor that stimulates certain demands on the fit of an incentive concerns contextual variables that comes with the function of, legislation on, enterprise on, or daily practices of a certain archetypical land-use (paragraph 4.5.2). Thus in order to find out what exact factors determine the true fit of an incentive, firstly a proper inventory of perceptions and perspectives of the relevant archetype has to be performed. This is basically the scope of the just completed Communication-phase (figure E.5). And in addition to that a search for the contextual frameworks that applies to the subjected archetype and land-use or the development area has to be performed too. Contextual variable can be found in a broad sense in e.g. institutional policy, (regional) trends or local habits, but also in events. To fulfill this exercise an initiator has to absorb local knowledge of the developing area. To serve the example for the two archetypes – Residential archetype (1) and the Agrarian archetype (2) – who are subject of this elaboration these variables are invented for the following factors:

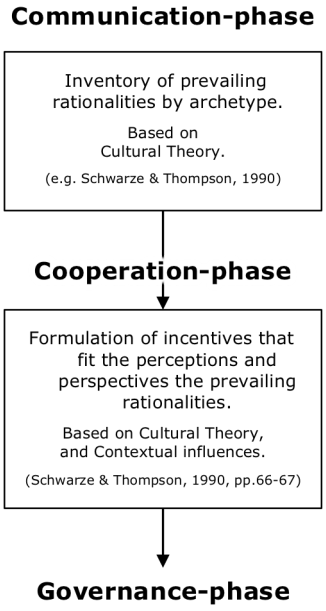

Figure E.5.

Ad 1) Residential archetype: As the Residential archetype has an *Egalitarian* rationality the perception of importance of preserving existing values prevails dominantly within this archetypical zone. The same holds for a perspective of protection of these values (paragraph 4.3.2 and 4.3.3). Incentives for this specific archetype should therefore be sought in the prevention of losing values (e.g. mitigation), or bringing back the lost of cultural/natural/environmental values (lost of values as a result of the implementation of a measure). As the village of Cothen concerns a small-scale rural settlement, its inhabitants generally attach a high values to its small-scaled character. In the overall attitude of a typical Cothen's resident features an *"Everything should remain at the old"*-attitude. Soon an unfamiliar landscape architect, without any local knowledge, designs a *Natural inundation land with a nature development target* in a rational and technocratic way, while neglecting these *"Local"* values, one may expect fierce opposition. Which utterly results into lack of cooperation. A solid incentive for this archetype in this particular development area may be the involvement of these actors into the design process of the measure. The latter requires amongst other things participation of the actors in the planning process (e.g. Arnstien, 1969);

Ad 2) Agrarian archetype: Within the Agrarian archetype the *Individualistic* rationality prevails. Reasoned from Cultural Theory this rationality comes with perceptions and perspectives that focuses on entrepreneurship (Schwarz & Thompson, 1990). As discussed previously, perspectives within this archetype will be reasoned from a rather neoliberal and opportunistic point of view. The later implicates amongst other things that profitability will never be compromised. Taking that fact in to account, a requests for a piece of agricultural land on which this type of actor undertakes a business, will directly impact their enterprise, because of legislation that relates agricultural livestock sizes to the location size (Algemene Maatregel van Bestuur [AMvB] *Grondgebondenheid*, 2016). The overall attitude of a typical agricultural entrepreneur will give priority to the business revenue that guarantees the actors livelihood. To arrive at cooperation, incentives that deal with these dilemmas are expected to be more effective for actors within this archetype, instead of incentives that rather create problems. A permit that allows an agricultural company to grow economically in an alternative (innovative) way, adopts the opportunistic laissez faire attitude of the individualist rationality.

Governance-phase

This fourth and last phase of the here proposed strategy arranges the in the prior Cooperation-phase formulated incentives. During this particular exercise the modes of governance, that will be capable to both organize the actual establishment of the formulated incentive and secure a legitimate implementation of them, need to be organized. This phase of the strategy is especially an important exercise soon there is a need for more comprehensive incentives that are based on goods and services that are outside the influence sphere of the initiator. To a certain extent this holds for the proposed incentive of participation that should move the Residential archetype of actors towards cooperation with the implementation of the planned natural inundation land. But it holds to a large extent for the incentive of a build permit that should move the Agrarian archetype of actor towards cooperation for digging natural shaped shorelines on the entrepeneurs land; as HDSR is not the legal government that issues build- and environmental permits. However, the last decade a paradigm shift in the Dutch planning approach took place. Instead of rational planning a shift towards communicative and interactive planning was integrated. For initiators of public works this implicates they can no longer focus on just their sectoral theme. A key design principle during an interactive areal development approach regards good collaboration between the various institutions that are

associated with managing the area; especially for the sake of coordinator for a good coherence between the multiple spatial functions (Bruijn & Heuvelhof, 1999). Taking the later into account, for the here elaborated HDSR project this implicates that the initiating water board (HDSR) has to determine how to organized those incentives in a sustainable way. The following modes of governance can be taken; for the Residentials (1) and Agrarians (2):

Ad 1) Residential archetype: In case of the development of the *natural inundation land with a nature development target* at project location 14, the *Municipality of Wijk bij Duurstede* is the owner of the proppery, and the legal function (*Nature*) of the plot fits the planned measure. However, the site is completely enclosed by an zone of residential actors who have the capability to oppose to the plan and thus cause stagnation of the planning process (lack of cooperation). To prevent such a stagnation the incentive of participation is suggested. Mainly because such opposition stem from the fact that the Residential archetype of actor expects a negative outcome for their living environment; to the extent of local landscape values. By the incentive of participation in the planning process, these actors will become able to incorporate their local values into the plan. In order organize that specific incentive, a mode of *Governance-as-network* is suggested. For the fact that such an approach acknowledges that the definition of spatial conditions belongs to their knowledge. The inclusion of these actors into the planning process is an important exercise because they have access opposition (presence of a hindrance);

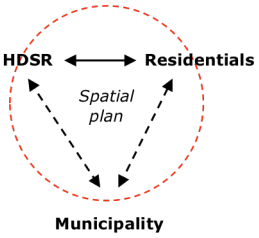

Figure E.6.
Governance-as-network

Table E.1. Stakeholders analysis; Project location 14

Actor	Role	Interest (desire)	Powerbase	Instruments
HDSR (water board)	*Initiator*	*Implementation WDF-task*	*Investor*	*Legitimacy*
Residential actors	*Stakeholder*	*Valuable living-environment; Local landscape*	*Opposition*	*Cooperation*
Municipality (Wijk bij Duurstede)	*Facilitator (Areal manager)*	*Coherent management area*	*Regulating institution*	*- Legislation - Property*

Ad 2) Agrarian archetype: Agrarian archetype: In case of the development of a *natural shaped shoreline* at project location 15, the *agrarian actor* is the owner of the proppery. The location on where the measure is projected, is fully in use as agricultural production land, and thus part of the tangible assets of an entrepreneur. For reasons just discussed (AMvB Grondgebondenheid 2016) this entrepeneur will not be eager to cooperate. Because losing hectare's of land directy impacts the business revenue. To arrive at cooperation an incentive that deals with that dilemma, in the form of a permit that allows an agricultural company to grow economically – e.g. by the development of a mega cattle stable – could bring solutions here. However, issuing build- and environmental permits belongs to the scope of the Municipality of Wijk bij Duurstede. In order to establish such an incentive needs a more complex mode of governance, because the effect of issuing such a permit reaches wider than the location itself. The later because of aspects like e.g. policy, shaping precedents or social desirability. Therefore a much more comprehensive mode of governance is needed; a mode that is capable to incorporate a wider spatial context into the issuing process. The *Multi-scalar meta governance* mode gives levarage to further esteablish this incentive at different levels of scale.

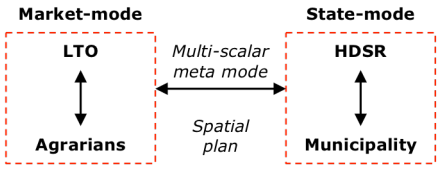

Figure E.7.
Political-economy-approach

Table E.2. Stakeholders analysis; Project location 15

Actor	Role	Interest (desire)	Powerbase	Instruments
State-mode:				
HDSR (water board)	*Initiator*	*Implementation WDF-task*	*Investor*	*Legitimacy*
Municipality (Wijk bij Duurstede)	*Provider*	*Coherent management area*	*Permit issuing*	*- Legislation - Policy - Permits*
Market-mode:				
Agrarian actors	*Stakeholder*	*Business revenue*	*Cooperation*	*Possession of the location.*
LTO *Land and Horticulture trade Organization*	*Negotiator and Interests representative*	*Economic interests and Social position of agrarians*	*Lobby*	*Knowledge*

Resume

To resume, this specific appendix (E) was written in order to illustrate what the rather abstract model of the *"Prism"*-concept implicates in a practical environment. For this purpose an example of how a *"Cooperation"*-strategy as proposed by this project (section 4.5, paper 3), could be applied into a recent WDF-project in the Kromme Rijn catchment area. For this HDSR project 431404, known under the nam *"Oevers Middelweerd-Van Rooijen"* served as an example case. This specific project has been chosen because the spatial layout of the planning area features great resemblance with the two in section 4.5 (paper 3) elaborated archetypes.

Contentwise, the project concerned the construction of a *Natural inundation land with a nature development target* and the development of a *Natural shaped shoreline*. The supposed Cooperation-strategy is built around the three core insights gained during this research project. Basically the strategy comprises the three phases of the *"Prism"*-concept. Namely, a 1) *Rationality-phase*, a 2) *Communication-phase*, a 3) *Cooperation-phase*, and a 4) *Governance-phase* (figure 4.4). If such a strategy is applied to the HDSR project, the planning area will be divided into two archetypical zones during the first *Rationality-phase*. An exercise performed based on the local zoning plan (figure E.4.a). Where after the second *Communication-phase* assigns fitting rationalities to the archetypical actors within these zones (figure E.5). This exercise builds on the intellectual legacy of Cultural Theory (chapter 2/paper 1). The idea is that each archetype should feature to a high extent the same rationalities due to the fact they all are located on property that feature the same legal functions. During the following third *Cooperation-phase*, incentives that should stimulate the archetypical actors into cooperation, must become formulated. In order to find out what stimulates the archetypical actors an inventory of the perceptions and perspectives of the archetype needs to be performed. This includes a search for the contextual framework that applies to the subjected archetypes. The knowledge of these three phases of the strategy serve as input for the fourth and last *Governance-phase* of the strategy. This particular phase establishes the in the prior phase formulated incentives. This actual phase is introduced because issuing incentives is not self evident. Especially incase the incentive is based on goods and services that are outside the influence sphere of the initiator. During this phase the initiator tries to seek good collaboration between the various institutions that are associated with managing the area, in order to organize the actual establishment of the incentive. After completing that exercise the implementation process of the measure should be able to follow its actual IMS project cycle (figure E.8). In such sense that after arriving at the establishment of an incentive its is assumed that the desired cooperation with the implementation will be reached.

Figure E.8.

Notes

1 Prevailing local zoning plan: The valid land-uses for the Village of Cothen are ordained in the area-wide zoning plan *"Buitengebied 2015"*, which is established by the Municipality of Wijk bij Duurstede.

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