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Understanding culture in territorial management and its implications for spatial planning

The case of floodplain management in urbanised delta regions in the Netherlands and Thailand

Suwanna Rongwiriyaphanich

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Preface

This book is a product of a five-year PhD research project, carried out mainly in Delft, the Netherlands. This book would not be a success without great contributions of my main supervisor ('*promotor*' in Dutch) - Prof.Vincent Nadin. The story began in November 2008 that I first came to meet him with my proposed technocratic topic relating to land use modelling for effective floodplain management. Through fruitful discussions with him, the cultural-sensitive part embedded deeply in myself was brushed up and became more apparent to me again. The discussions I had with him has broadened my point of view in regards to spatial planning, by linking it more to social and cultural aspects of planning rather than technological aspects which were the focus of my initial research topic. As an urban planner, who was born and raised in the old town of Bangkok where culture flourishes with great diversity and water has been an essential element of people's life, I started to reshape my thoughts and questioned how cultures, water elements and spatial development patterns interrelate.

After reviewing relevant literature on culture from diverse fields, I found that the topic about influences of culture on different fields of management has increasingly gained attention from scholars in various fields, including the field of spatial planning. Yet, the literature review shows that development and application of a common methodology and conceptual framework for comparative studies that may help provide a better understanding on this topic in the field of spatial planning is still rather limited. That was the beginning of this research project and the book, which involved significant changes from my initial intention which I do not regret.

This book elaborates how an integrative conceptual framework developed by the author can be used to explain interrelationships between culture, planning policy and territorial management outcomes, and what are the implications of those interrelationships for spatial planning. Despite of the concentration on analysis of floodplain management in the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand, the theoretical level of analysis present in this book provides an understanding of the topic to a wider scope than the topic of floodplain management and is not limited to the case study areas only. This means that not only researchers and practitioners in the field of spatial planning may benefit from reading this book, but so do other groups of readers.

Finally, I would like to express my sincere gratitude to people and institutions that either directly or indirectly contributed to this long journey of my PhD study. First and foremost is my highest gratitude and appreciation to my supervisors - Prof. Vincent Nadin and Dr.Roberto Rocco – for their continuous support, patience and encouragement both academically and mentally throughout the study. The greatest

lesson I have received from you is the attitude of a great and open-minded advisor, who devotes their precious personal time listening to advisees when they need it. I am also obliged to the Royal Thai government who provided me financial support for studying and gaining valuable experiences abroad. I would also like to thank all the scholars whose their work inspired me, especially Elinor Ostrom and Michael Thompson. This dissertation could not have taken its current form without the inspiration I received from their theories and research projects. Special thanks also go to all staff members of the Urbanism secretariat for their continuous kind support, even for little personal things I need help with. Thank you to all the colleagues as well as Thai students in Delft, especially Nim, Hebe, Astor, A-Khun's family, Alex Wandl, P'Wan and C.J., and many others that I cannot include all their names here, for their great friendship and support from material, technical and mental needs. Last, but not least, I would like to devote all the achievements I have accomplished in my life to my parents and siblings for always being there whenever I need them, and having great faith in my decision.

Suwanna Rongwiriyaphanich

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List of Abbreviations

BMA	Bangkok Metropolitan Administration
BRRD	Bureau of Rice Research and Development
CBD	central business district
CBS	Centraal Bureau voor de Statistiek
CEC	Commission of the European Communities
CPD	City Planning Department
DDS	Department of Drainage and Sewerage
DOL	Department of Lands
DPT	Department of Public Works and Town & Country Planning
DTCP	Department of Town& Country Planning
DWR	Department of Water Resources
ESRI	Environmental Systems Research Institute
EU	European Union
IAD	Institutional Analysis and Development
IPCC	Intergovernmental Panel on Climate Change
KMUTT	King Mongkut's University of Technology Thonburi
LDD	Land Development Department
MNRE	Ministry of Natural Resources and Environment
n.d.	no date
NGO	non governmental organisation
NSO	National Statistical Office
PDOK	Publieke Dienstverlening op de Kaart
PWD	Public Works Department
RID	Royal Irrigation Department
RIDA	Research Institute of Development Assistance
SEDAC	Socio-economic Data and Applications Center
TOR	terms of reference
UNESCO	United Nations: Educational, Scientific and Cultural Organization
VINEX	Vierde Nota Ruimtelijke Ordening Extra
WB21	Waterbeheer 21e eeuw
WVS	World Values Survey

Summary

Previous experiences have shown that the implementation of planning policy does not always lead to the originally intended territorial management outcomes. This issue is particularly crucial when policy ideas, institutions, models and programmes are transferred into places with different cultural settings without adaptations (Knieling and Othengrafen 2009b; Sanyal 2005). These unexpected consequences in planning practice and management outcomes have brought a significant amount of attention to the importance and roles of culture on shaping decision-making in territorial management process and determining transferability of a policy (Friedmann 2005a, 2005b; de Jong and Mamadouh 2002; Sanyal 2005; Ostrom 2005a; Knieling and Othengrafen 2009b). However, conceptual frameworks that seek to understand the roles of culture and its implications for spatial planning are still rather limited.

This study presents and applies an integrative conceptual framework which is used to explain *how culture, planning policy and territorial management outcomes are interrelated, and what the implications are for spatial planning*. The framework integrates relevant theories and ideas from anthropology, organisational management and political sciences to understand influences of culture on spatial planning. The integrative framework suggests a way of characterising territorial management in the form of ideal types. This helps simplify cultures regarding territorial management to make them comparable. It enables an analysis of 'cultures' that includes a broader scope of culture than existing frameworks that focus primarily on 'planning cultures' expressed in forms of planning systems, organisations and instruments. This broader scope includes also the implicit expressions of culture in informal forms, such as ideas, customs and social behaviours shared by involved actors in the management of a given territory.

The framework also offers two analytical perspectives to investigate whether culture is an important element (or context variable) explaining planning practices and territorial management outcomes in different settings. These perspectives are the analysis that assumes a stable state of culture (a synchronic perspective) and the analysis that considers culture as dynamic and interrelating with other context variables (a diachronic perspective). Findings derived from the analysis of the case studies based on these two perspectives help draw theoretical conclusions about how planners may deal with culture in order to improve planning practices.

The study investigates territorial development processes in the context of floodplain management in urbanised delta regions. This specific context is selected because of its strong relations between physical attributes and spatial planning activities. The analysis is carried out based on a comparative approach at two levels. At the cross-

national level, the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand are used as case studies. The comparative approach is useful for this study because culture can be best understood in a relative form. The sub-national analysis emphasises comparison of floodplain management in three selected districts in the Chaophraya delta region. The two levels of analysis are carried out in order to understand whether the influences of cultures on planning practices and territorial management outcomes at different scales of development are affected by similar elements. Besides the theoretical contribution, this study also contributes methodologically through development of a common conceptual framework that can be applied to the analysis of various issues in territorial management, which is not limited only to the subject studied here. The framework is also expected to be applicable for the analysis of territorial management in a diverse range of cultural settings.

The findings derived from a synchronic analytical approach validates arguments given by previous studies (such as de Jong and Mamadouh 2002 and Stead *et al.* 2008) regarding the importance of 'conformity' between policy content and local cultures for enhancing achievement of policy implementation and transfer. The findings from a diachronic perspective contribute to understanding of dynamic dimensions of culture as interrelating to other context variables. It reveals that cultures regarding floodplain management can be categorised into two parts – (i) the part that is significantly affected by core values and (ii) the experiential part of culture with close relationships with physical environments. Each dimension of culture regarding floodplain management is sensitive to each part of culture to different degrees. Furthermore, the analysis reveals two fundamental conditions required to promote effective management of collective tasks. They are (i) a unified perception towards shared problems and solutions; and (ii) management that acknowledges local institutions throughout planning process.

In short, the conceptual framework proposed in this study proves to be helpful in gaining a better understanding of culture regarding territorial management and its implications for spatial planning. The findings imply that despite the significant influences of cultural preconditions in shaping planning practices and territorial management outcomes, planners may use spatial intervention mechanisms to ensure that outcomes match initial policy objectives. This could be done through the promotion of caution and cultural sensitivity in policy design, and in selecting appropriate implementation mechanisms to match the local preconditions.

Samenvatting

Uit ervaring is gebleken dat de uitvoering van planologisch beleid niet altijd de beoogde resultaten oplevert op het gebied van territoriaal beheer. Dit gebeurt met name wanneer beleidsideeën, -instanties, -modellen en -programma's ongewijzigd worden overgenomen op locaties met andere culturele normen en waarden (Knieling and Othengrafen 2009b; Sanyal 2005). Door het optreden van zulke onverwachte gevolgen in de planologische praktijk en bij planologisch beheer is er veel aandacht ontstaan voor het belang en de rol van cultuur bij de besluitvorming ten aanzien van territoriale beheerprocessen en het bepalen van de geschiktheid van een bepaald beleid voor toepassing ergens anders (Friedmann 2005a, 2005b; de Jong and Mamadouh 2002; Sanyal 2005; Ostrom 2005a; Knieling and Othengrafen 2009b). De conceptuele kaders voor het verkrijgen van meer inzicht in de rol van cultuur en de gevolgen daarvan voor planologie zijn echter nog steeds vrij beperkt.

In dit onderzoek wordt een integratief conceptueel kader gepresenteerd en toegepast om *inzicht te krijgen in de onderlinge samenhang tussen cultuur, planologisch beleid en de resultaten van territoriaal beheer en de gevolgen daarvan voor planologie*.
In het conceptuele kader zijn relevante theorieën en ideeën uit de antropologie, organisatiekunde en politicologie geïntegreerd om inzicht te krijgen in de invloed van cultuur op planologie. Het integratieve kader biedt handvatten voor het karakteriseren van territoriaal beheer in de vorm van ideale types. Daardoor is het mogelijk om culturen met betrekking tot territoriaal beheer te vereenvoudigen om ze te kunnen vergelijken. Dat biedt mogelijkheden om 'culturen' breder te analyseren dan met bestaande kaders, die zich vooral richten op 'planologische culturen' die tot uiting komen in planologische systemen, organisaties en instrumenten. Tot de bredere analyse behoren ook impliciete cultuuruitingen in informele vorm, waaronder ideeën, gewoontes en sociale gedragingen die actoren die betrokken zijn bij het beheer van een bepaald territorium met elkaar gemeen hebben.

Daarnaast biedt het kader twee analytische invalshoeken waarmee kan worden onderzocht of cultuur een belangrijk element is (of een belangrijke contextvariabele) die de planologische praktijk en de resultaten van territoriaal beheer in verschillende omgevingen verklaart. De twee invalshoeken zijn: een analyse waarbij wordt uitgegaan van een stabiele culturele situatie (synchroon perspectief) en een analyse waarbij cultuur wordt beschouwd als dynamisch en onderling verbonden met andere contextvariabelen (diachroon perspectief). Met behulp van de resultaten van de analyse van de casestudy's die met deze twee invalshoeken zijn gegenereerd kunnen theoretische conclusies worden getrokken over de manier waarop planologen met cultuur zouden moeten omgaan om de planologische praktijk te verbeteren.

Voor dit onderzoek zijn territoriale ontwikkelprocessen onderzocht in de context van het beheer van uiterwaarden in verstedelijkte deltagebieden. Er is voor deze context gekozen vanwege de sterke verbanden tussen de fysieke omstandigheden en planologische activiteiten. De analyse is uitgevoerd op basis van een vergelijking op twee niveaus. Op grensoverschrijdend niveau zijn de Rijn-Maasdelta in Nederland en de Chaophraya-delta in Thailand als casestudy's gebruikt. Een vergelijkende benadering is voor dit onderzoek bruikbaar aangezien cultuur het beste relatief kan worden begrepen. Bij de subnationale analyse lag de nadruk op een vergelijking tussen het uiterwaardenbeheer in drie districten in de Chaophraya-delta. De analyse wordt op twee niveaus gedaan om te onderzoeken of het vergelijkbare elementen zijn die de invloed van de cultuur op de planologische praktijk en de resultaten van territoriaal beheer bij verschillende stadia van ontwikkeling beïnvloeden. Naast een theoretische bijdrage levert dit onderzoek ook een methodologische bijdrage door de ontwikkeling van een gemeenschappelijk conceptueel kader dat kan worden toegepast om diverse aspecten van territoriaal beheer te analyseren en niet is beperkt tot het onderhavige onderzoeksonderwerp. Naar verwachting zal het kader ook bruikbaar zijn voor de analyse van territoriaal beheer onder verschillende culturele omstandigheden.

De bevindingen die het resultaat zijn van de synchrone analytische benadering valideren argumenten uit eerdere onderzoeken (waaronder de Jong and Mamadouh 2002 en Stead *et al*. 2008) met betrekking tot het belang van inhoudelijke aansluiting tussen beleid en lokale cultuur voor een betere beleidsuitvoering en -overdracht. De resultaten van de diachrone analyse leveren een bijdrage aan ons inzicht in de dynamische aspecten van cultuur in onderling verband met andere contextvariabelen. Daaruit blijkt dat culturen met betrekking tot uiterwaardenbeheer kunnen worden opgedeeld in twee delen: (i) het deel dat significant wordt beïnvloed door kernwaarden en (ii) de beleving van een cultuur die nauw samenhangt met de fysieke omgeving. Elke culturele dimensie van uiterwaardenbeheer is in enige mate gevoelig voor alle andere aspecten van een cultuur. Daarnaast komen uit de analyse twee basisvoorwaarden naar voren voor effectief beheer van collectieve taken, namelijk: (i) een uniforme perceptie van gemeenschappelijke problemen en oplossingen, en (ii) beheer dat lokale instanties gedurende het gehele planologische proces erkent.

Kort gezegd levert het conceptuele kader dat in dit onderzoek wordt gepresenteerd een bijdrage aan het verkrijgen van meer inzicht in cultuur met betrekking tot territoriaal beheer en de gevolgen daarvan voor de ruimtelijke planning. De bevindingen impliceren dat planologen, ondanks de grote invloed van culturele randvoorwaarden op de invulling van de planologische praktijk en de resultaten van territoriaal beheer, toch ruimtelijke interventiemechanismes kunnen gebruiken om te garanderen dat de resultaten aansluiten op de oorspronkelijke doelstellingen van het beleid. Dat is mogelijk door aandacht te vragen voor oplettendheid en culturele gevoeligheid bij de beleidsvorming en door geschikte implementatiemechanismes te kiezen die aansluiten op de lokale omstandigheden.

PART I Relevance of Culture regarding Territorial Management and Spatial Planning

1 Introduction to the study

2 Understandings of culture in the context of territorial management

3 Research methodology and the proposed integrative conceptual framework

1 Introduction to the study

Why is understanding culture regarding territorial management necessary for spatial planning?

There have been extensive studies on which elements influence planning practices and spatial development outcomes. Previous studies have primarily emphasised the investigation of the influence of planning policies and instruments (formal institutions) on planning practices. However, evidence from past developments has shown that territorial management outcomes do not always conform to planning objectives. Inconformity is especially evident when policy ideas, institutions, models and programmes are transferred without adjustment to local preconditions (Knieling and Othengrafen 2009b; Sanyal 2005). This evidence implies that there are more elements than formal institutions that influence territorial management outcomes. These factors are interrelated and form complex implementation environments. They are, for instance, resource constraints, economic conditions, political environments and social discourses. Amongst these factors, many studies have pointed to the significance of culture on influencing decision-making processes and partly shaping planning practices and development outcomes. These studies include, for instance, Friedmann (2005a, 2005b), de Jong (1999), Sanyal (2005), Knieling and Othengrafen (2009b), Ernste (2012) and Evan, York and Ostrom (2008).

The term 'culture' here refers to ideas, customs and social behaviours shared by involved actors in management of a given territory. Friedmann (2005b, 30) asserts that '*... a universal planning discourse must proceed by way of an acknowledgement of local, regional, and national differences in planning institutions and practices; I shall call them cultures.*' This statement emphasises the significance of cultures in the processes of policy-making and implementation. It implies a crucial role of culture on shaping of how plans and policies are understood and reacted upon in different settings. Hence, it appears essential to develop a better understanding of culture regarding territorial management and its influences on spatial planning. A better understanding and awareness of cultures regarding territorial management in spatial planning would help policy makers and planners to enhance the congruity and applicability of plans or policy initiatives to local preconditions, so that expected outcomes can be achieved. Additionally, it may also help reduce undesirable consequences produced by cultural unawareness or insensitivity.

What is crucial knowledge required for understanding culture regarding territorial management and its relation to spatial planning?

There have been great efforts in cross-cultural comparative studies to understand how culture regarding territorial management can be characterised and what its influences on planning policy and territorial management practices are. These studies include, for instance, Sanyal (2005), Knieling and Othengrafen (2009b), Salet *et al.* (2003). However, knowledge regarding these aspects in the spatial planning discipline remains rather limited (Othengrafen 2012; Reimer and Blotevogel 2012). The approaches employed by previous studies were mainly based on narrative analyses that emphasise only a limited number of aspects in the selected case studies. These studies generate valuable knowledge to the spatial planning discipline. Yet, inconsistency amongst these frameworks has resulted in limitations for the general understanding of the roles of culture in spatial planning. It is still rather difficult to use the knowledge derived from these studies to explain situations in different settings rather than in the contexts where those particular case studies took place. One of the central problems of the previous studies is the lack of a common methodology and of a common conceptual framework for comparative studies (Othengrafen 2012). A series of studies based on common framework for analysis would help gather incremental knowledge, which would then contribute to the better understanding on the relevance of cultures to territorial management and its significance for spatial planning.

There are several frameworks for analysing influences of culture in the formal planning systems. These include the frameworks based on legal families and administrative structures developed by, for instance, Davies *et al.* (1989), Newman and Thornley (1996) and the Commission of the European Communities (CEC 1997). However, these conceptual frameworks focus exclusively on understanding cultures present in formal structures of planning. The usability of these frameworks to understand influences of informal aspects of planning in territorial management is rather limited. These informal aspects include, for instance, ideological and normative thoughts. Understanding these aspects is essential because they are presumed to be significant elements underlying the formation of formal structures, planning practices and development outcomes. In short, an integrative conceptual framework that explicitly includes both formal and informal aspects of territorial management is still lacking and is called for. It is expected that such an integrative framework would help improve the understanding of significance of culture regarding territorial management for spatial planning to a broader and deeper level than the existing frameworks do.

1.1 Aims of the study

This study aims at developing a better understanding of culture regarding territorial management and exploring its implications for spatial planning, both theoretically and methodologically. The theoretical development is expected to help raise awareness amongst planners on the importance of culture for the management of territory. It is also expected to help assist planners on how they may incorporate society preconditions in the policy-making and implementation processes, in order to promote the congruity and applicability of territorial management policy, so that desirable outcomes can be expected.

Regarding the methodological contribution, it is expected that the knowledge gained through the empirical analysis would help develop a conceptual framework that serves as a common ground that other researchers can apply for analysis of a wide range of issues in relation to culture, spatial planning and territorial management practice. It is also expected to help bridge knowledge gaps across disciplines, including spatial planning, cultural studies and public policy analysis. This bridging would improve the communication and understanding amongst academics and practitioners from different disciplines, which may contribute to improving the performance of planning in practice.

However, developing generalised understandings and a common framework for analysis that could be applied to various issues in the study of territorial management is a rather ambitious task. Floodplain management in urbanised delta regions is thus selected as a pilot issue for investigation. The analysis of this specific issue would provide a small step and would contribute towards the theoretical and methodological development of a more general understanding of the subject.

The issue of floodplain management is selected because of two main reasons. First, the nature of this issue offers great opportunities to develop understandings of relationships between cultures, physical environments and spatial planning activities. Understanding the impacts of physical attributes on people's perception and their decision-making is particularly useful for the development of a general framework for analysis of diverse ranges of spatial planning policies. Second, developing understandings between culture and management of flood-related issue is important and acute. This is because urbanised delta regions around the world are facing common challenges of extreme flooding, resulting from more severe and frequent extreme climatic events (Aquaterra 2009; IPCC 2008). Transfers of knowledge, technologies and policies from a so-called 'best-practice' have taken place in many deltas around the world, aiming to solve these seemingly common challenges.

A better understanding on this particular issue would provide awareness for planners and policy makers on how they may incorporate cultural aspects in the design and implementation of spatial planning policies in order to improve performance in planning practice. These understandings would help assist them to deal better with transferred knowledge, technologies and policies, in order to ensure the transferability and delivery of planning objectives in territorial management practices.

1.2 Research questions

In order to achieve the aims of the study, the research investigates a central research question '*how are culture, planning policy and territorial management outcome interrelated, and what are the implications for spatial planning?*' The analysis of the interrelationship between culture, planning policy and territorial management outcome is undertaken with particular concern regarding the dynamic conditions within which the territorial management process takes place. This includes influences of culture on decision-making of all involved sectors and the other way around, as explained in Figure 1.

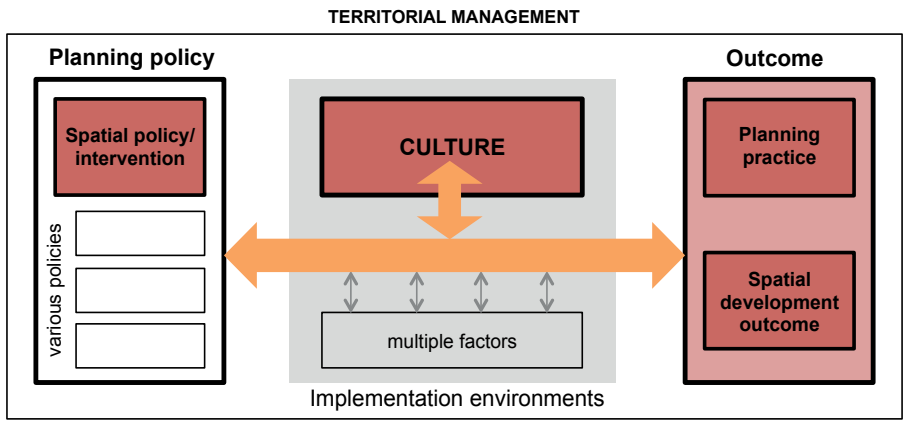

Figure 1
Conceptual diagram of the focus of the study

In order to answer the main research question, there are four main theoretical questions to investigate, as listed below.

A-1 What are the critical characteristics of culture in relation to territorial management?
A-2 How can culture be used to explain and understand territorial management?
A-3 What are the elements in relation to culture that significantly influence decision-making and actions in territorial management processes?
A-4 What are the implications of culture for designing and implementing spatial planning policies?

The above questions are general questions that underpin the development of the conceptual framework in this study. The conceptual framework developed here is then applied to explore the role of culture in the more specific circumstances of floodplain management in the case studies and its implications for spatial planning. The empirical study is conducted in the context of floodplain management in selected urbanised delta regions. Two issues as listed below are investigated empirically.

B-1 What are the differences and similarities of cultures, planning policies and territorial management outcomes in the specific context of floodplain management in different urban development settings?
B-2 Is culture an important element explaining similarities and differences of planning policies and territorial management outcomes in relation to floodplain management in different urban development settings?

The analysis regarding territorial management outcomes emphasises particularly investigation of planning practices and spatial development outcomes, as shown in Figure 1. This is to serve an aim of the study, which is to gain better understanding of implications of cultures regarding territorial management for spatial planning. The findings and remarks derived from applying the tentative conceptual framework provide feedbacks for improving the applicability and validity of the conceptual framework in explaining territorial management in diverse range of settings. Relations between these questions and the content of the study (by chapters) are further elaborated in Section 1.4.

1.3 Definitions of key terms

Spatial planning and territorial management

The term 'spatial planning' and 'territorial management' are used in this study with a minor but important distinction. Here, the term 'spatial planning' is based on the definition given by the Commission of the European Communities (CEC 1997) and United Nations: Economic Commission for Europe (UNECE 2008). It refers to the activities in the territorial development processes that are executed largely by the public sector to influence the future distribution of people and activities in a given territory. The term 'territorial management' is used to cover a broader scope of activities in the territorial development processes. It refers to actions of any involved actors and their interactions that take place and shape the territorial management outcomes in the given territory. In simple terms, territorial management includes not only the planning activities executed by public sector, but also the ways sectors other than the public sector react upon the spatial planning mechanisms executed by the public sector.

Based on the definition above, it is worth emphasising again that the aim of this work is to understand the influences of culture on 'territorial management', by considering a broader scope of influences of cultures on the entire process of territorial development rather than in 'spatial planning' only. Yet, the use of the findings emphasises how to take into account the cultural aspects to improve 'spatial planning' in practice. The scope of spatial planning is differently defined in different contexts. Here, spatial planning mechanisms refer to territorially-based strategies that help coordinate the spatial dimension of sectorial policies to reconcile policy goals in economic, social and environmental development in a given territory. This is based on the definition of 'spatial planning' given by Cullingworth and Nadin (2006, 91), Koresawa and Konvitz (2001) and UNECE (2008, 1). It means that spatial planning includes more than the management policies that directly impact physical environments, such as land use planning, transport networks and the form of the built environment. It also covers soft measures of planning rather than spatial arrangement, such as communication with the public and institutional arrangements for territorial management.

'Cultures' and 'institutions' in territorial management

In this study, the term 'cultures' in relation to territorial management refers to the formal and informal ways through which the organisation of a given spatial entity is conceived, institutionalised, and enacted by involved actors. This definition is based on the definition of 'planning cultures' given by Friedmann (2005a). It covers a broader scope of meaning than what 'cultures' are traditionally defined as in the spatial planning discipline (see Section 2.1 for further detail). Its scope includes not only the manifest

or explicit forms of planning cultures, such as planning systems, organisations and instruments, but also the non-manifest or implicit ones. These non-manifest/implicit forms of culture include, for instance, traditions, values, beliefs and worldviews in relation to territorial management shared by the community or the group of people.

The above definition of 'cultures' corresponds to the term 'institutions' defined in the institutionalist studies. Ostrom (2005b, 3) defined 'institutions' as '*... the prescriptions that humans use to organize all forms of repetitive and structured interactions at all scales*'. According to Ostrom, these prescriptions include both formal and informal forms of rules and norms on which the society is based. In this sense, 'institutions' refer to a broader meaning than just an organisational arrangement as usually referred to by various literatures in the spatial planning. The term covers also the non-manifest parts and the underlying conditions that underpin the decision-making and actions.

In this sense, the two terms share rather similar meaning. Yet, there are slight differences attached to how these terms are used in this study. Here, the term 'cultures' is used to describe management values in general. The term 'institutions' is used to indicate a particular form of culture. An example using the term 'institutions' is for distinguishing cultural expressions at different levels, i.e. the constitutional, the structural and the operational levels (see Section 2.3 for further detail). The term is also used to distinguish between formal and informal institutions, which are different forms/levels of cultural expressions. In addition, a significant feature that the two terms share is the idea that cultures and institutions are historically grounded in a particular place or society (i.e. context-dependent), yet they are continuously evolving through history as circumstances change (see Chapter 2 and Chapter 3 for further detail of the terms' definition).

'Cultures' in floodplain management

In this study, floodplain management refers to the management of a territory and water system in which flood-related issues are prevalent. According to the above definitions, cultures in floodplain management refer to both formal and informal forms of conceptions, institutionalisation and operation of the involved actors to organise the use of the space and the resources to deal with the development constraints caused by floods in a given spatial entity of the delta. The organisation of space and resources includes the management of physical resources (land and water) and management of the social and power relations. The management of physical resources is connected to conceptions regarding relationship between human and nature as well as the institutionalisation and operation for water and the territorial management in relation to flooding issues. The management of social and power relations is connected to conceptions regarding social relations, the arrangement of organisational structures and the assignment of duties for managing flood-related issues by competent agencies. See Section 3.3 for further detail on the classification of culture in floodplain management.

1.4 Research design

The content in this study is organised into four parts. Figure 2 presents the structure of this study in connection with the main research components in order to answer the research questions

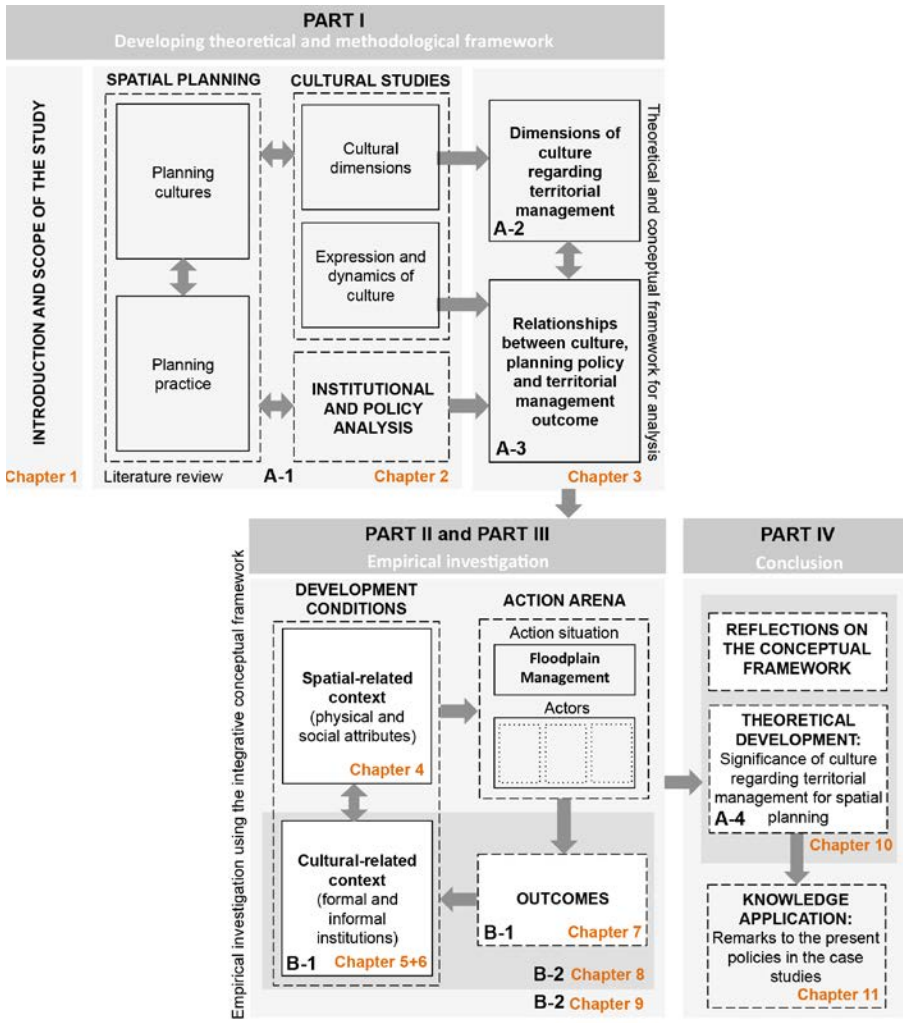

Figure 2
Structure of the study in connection with the related chapters and research questions

Part I explains the scope of the study and the theoretical and methodological frameworks underlying the empirical investigation. It consists of three chapters. Chapter 1 provides the background of the problem and the framework of the study. Chapter 2 provides critical analysis of relevant theories and understandings of culture in the context of territorial management from various disciplines, including spatial planning, cultural studies, organisation and management science and institutional studies. Chapter 3 describes the conceptual framework developed in this study based on the literature reviewed in Chapter 2. The framework developed in this work integrates existing theories in the fields of spatial planning, cultural studies and institutional and policy analysis. This integrative framework offers an approach to characterise and compare cultures, planning policies and territorial management outcomes. It also provides analytical frameworks to explore relationships between these three elements from a synchronic perspective (in which a stable state of culture is assumed) and a diachronic perspective (which considers culture as dynamic and interrelating with other development conditions). This integrative conceptual framework is used for empirical analysis in Part II and Part III in order to explore what are the significant elements of concern for planners from a cultural point of view to enhance the congruity and applicability of territorial management policy, so that desirable outcomes can be expected.

Part II consists of four chapters. Each of these chapters describes and compares physical, cultural and institutional settings as well as floodplain management practices and spatial development outcomes in the case studies. These chapters demonstrate how culture can be used to explain and understand territorial management. Comparisons are based on classification of conceptions and management approaches in a form of ideal types as proposed in the integrative conceptual framework for analysis.

Part III consists of two chapters. It focuses on examining relationships between cultures, planning policies and territorial management outcomes. It explores whether culture is an important element explaining similarities and differences of planning policies and territorial management outcomes in relation to floodplain management in different settings. The investigation is carried out using two analytical approaches. Chapter 8 analyses the roles of cultures in determining policy acceptance in practice from a synchronic perspective. Chapter 9 deals with a broader scope of analysis from a diachronic perspective, in which multiple conditions rather than cultural settings are taken into account in the analysis. These conditions include physical and social settings and institutional settings in relation to territorial management of the case studies. These two frameworks help decompose complex interactions between cultures, planning policies and territorial management outcomes in a form of relationships between a simplified set of variables.

Part IV addresses findings and conclusions derived from the empirical investigation in Part II and Part III. It consists of two chapters. Chapter 10 summarises the findings regarding the significance of culture in territorial management processes and the implications for spatial planning. It also identifies reflections on the integrative conceptual framework whether and how it helps to understand the significance of culture on influencing planning practices and development outcomes. Chapter 11 applies the knowledge and observations gained in this work to envisage possible effects of cultures on the implementation of the recent policies in the two case study regions. It addresses whether the policies are likely to be accepted in practice and which planning mechanisms can potentially improve the congruity and applicability of territorial management policies in different development settings.

Rationales of the cross-cultural comparison

This study employs the method of case study to seek explanations and generalisations amongst the case studies rather than to identify specificities of each case study. Cross-cultural comparison is an appropriate research method, as it considers culture in a relative form. This view of analysing culture helps to explain whether culture plays a major role in shaping diverse outcomes when a seemingly common planning policy or strategy was applied in different settings. The analysis is carried out at two levels, which are the cross-national and the sub-national levels. The cross-national analysis is suitable here because it is evident that planning activities are understood and practised differently in different cultural environments, and differences at the national level are rather significant (Hofstede 2011). This is due to the long history and socialisation processes of the present-day national communities. However, the sub-national analysis is necessary for developing a better understanding on influences of culture in planning practices at the local level. This is because it is not apparently known whether the influences of culture on planning practices at different levels of development are affected by similar factors. Figure 3 illustrates the simplified premises of the two levels of comparative analysis.

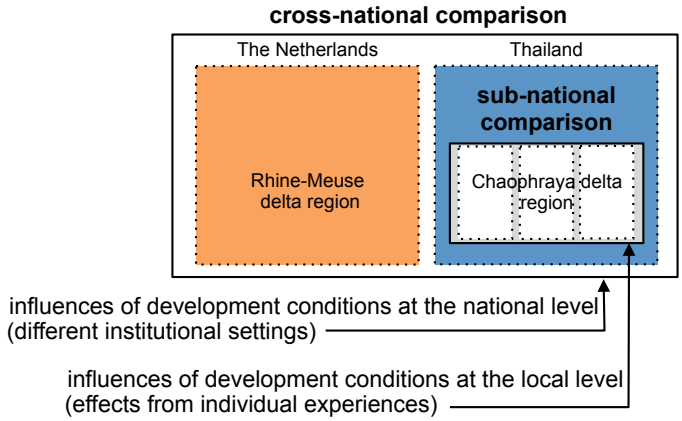

Figure 3
The structure and objectives of the two levels of comparative analysis

The analysis at the cross-national level investigates influences of development conditions in relation to cultures on decision-making processes regarding floodplain management at the national level. It primarily emphasises the influences of formal and informal institutional settings on territorial management outcomes. These institutional settings refer to common rules and values shared by people in a nation. The analysis at the sub-national level puts more emphasis on investigating the roles of local conditions that may impact individuals' experiences and create cultural variations at the local level (i.e. the scale of district in this case). It focuses on analysing how different physical environments and social conditions existing in each district affect individuals' experiences and the territorial management decisions they made in relation to flood-related issues.

Selection of the case studies

As the purpose of case study methods in this study is to seek explanations and generalisations, the case studies were selected strategically to maximise differences and similarities. This is to enable the use of constant comparative methods to relate multiple scrutinised data sets. However the selection of the case studies for the two levels of comparison is based on different criteria. For the cross-national comparison, the selection of the case studies is based mainly on their differences regarding the world views on environmental management. In addition, similar types of planning policies should exist in the selected cases, regardless of the implementation period of the policies. These conditions are crucial, because the cross-national comparison is carried out to examine whether informal institutions play a significant role in shaping the different outcomes produced in different places when similar types of management policy were applied.

According to the above criteria, the urbanised delta regions in the Netherlands and in Thailand are selected as the case studies. This is because urbanisation in floodplains has existed in these two regions for a long time, but their traditions and the underlying cultures in resource management as well as in social organisation are rather different. The Cartesian dualistic anthropocentric approach has been predominant in the territorial management in the Netherlands. This approach sees humans as the centre of a system that is separated from nature (Berkowitz *et al.* 2003). It is a perspective that has been embedded in Western cultures for centuries. On the other hand, the territorial management in the Thai case has been dominated by the rather holistic-eco-centric approach, which has been argued by several scholars as conforming to various traditional Eastern philosophies including Buddhism (Tucker and Williams 1997; de Silva 1998; Callicott and Ames 1989). This approach considers humans not as the centre of existence, but rather as being integrated with nature and forming single system (Jacobs 1995). These distinctive characteristics of the two case studies provide the conditions that meet the aforementioned criteria.

However, it should be noted that the scale of the territory employed for the analysis of core values and the spatial analysis are not the same. Data used for the analysis of core values is based mainly on the available data at the national level. Here, the term 'core values' refers to the underlying thoughts or principles one employs when making decision and actions. For the spatial analysis, many aspects of the analysis are carried out based on data at the regional level, which is limited to the urbanised areas of the deltas only. This is because cultures and policies in relation to floodplain management are argued here as likely being attached to the physical attributes of the specific area. As a result, spatial analysis based on data at the national level may not be suitable for the purpose of this study, especially for the country where physical attributes are significantly diverse like Thailand.

For this reason, the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand are selected as the areas for spatial analysis at the cross-national level. The territory of analysis is defined based on geography along side administrative boundaries. The Rhine-Meuse delta region is defined as corresponding roughly to the province of Zuid-Holland and parts of the provinces of Noord-Holland, Utrecht, Noord-Brabant and Gelderland. The Chaophraya delta region covers the area of Bangkok and five surrounding provinces where urban expansion from Bangkok occurred.

The selection of the case studies for the sub-national comparison is based on two fundamental criteria. This is in order to serve the purposes of the analysis at the local level, which is to examine relationships between territorial management outcomes and the other development conditions rather than the institutional settings shared by the communities at the national level. The first criterion is that the case studies have rather similar physical characteristics and institutional settings relevant to flood-related

management issues. In other words, they should be located in the same floodplain and share common core values and rules (i.e. common formal and informal institutions) regarding resource management and social organisation for the management of flood-related issues. This is in order to minimise possible influences of these conditions in the analysis. The second criterion is that the case studies should be associated with different combinations regarding the degree of flood risk, the objectives of planning policies and strategies, and management practices and outcomes. This variation is necessary for examining effects of physical and social environments on territorial management outcomes at the local level.

According to the above criteria, three districts located in the Chaophraya delta in Thailand are selected for the analysis at the sub-national level. They are Khlongluang, Bangkoknoi-Talingchan and Bangkhuntien. Table 1 shows the development conditions of the three districts. In general, these conditions show that the promotion of urban development is not conforming to the suitability of the land in relation to the degree of flood vulnerability. In addition, the spatial development patterns in the three districts neither follow the plans, nor are congruent with the degree of flood vulnerability of these areas. The variation of planning practices and spatial development patterns in these case studies reveals the possible existence of different local cultures in each district. It implies that the different local cultures are possibly influencing other development conditions rather than the common institutional settings by which the three districts share at the national level (e.g. values, norms and formal rules).

Variables	Khlongluang	Bangkoknoi-Talingchan	Bangkhuntien
Flood vulnerability	high	low	high
Land use plan	industrial and low-density residential uses	conservation for agriculture and low to medium-density residential uses	agriculture and low-density residential uses
Development patterns	large-scale industries, rice farming and medium-density settlements	orchards and low to medium-density settlements	small-scale industries, agriculture and low to medium-density settlements

Table 1
Summary of the conditions of the three case studies for the sub-national comparison

Methods for analysis

This study analyses the case studies at two levels – the cross-national level and the sub-national level. The analysis at each level uses different types of data and different research methods. The analysis at the cross-national level relies primarily on the secondary data from past research projects, surveys, published articles and government's documents. Secondary data is suitable for the analysis at this level because it helps minimise an otherwise massive time and budget required for collecting reliable data at the national level. These generalised data are considered sufficient for characterising cultures at the national level, which are then used for a broad comparison between the two urbanised delta regions. The analysis at the sub-national level relies on both primary and secondary data. The primary data was collected from the field, mainly through semi-structured interviews and field observations. The secondary data includes statistical data and spatial maps showing physical attributes of the area. Interviews and field survey are essential for the analysis at the sub-national level because in-depth information is necessary for understanding the specific cultures at the local level.

Regarding the methods for analysis, the empirical investigation is based on mixed research methods, with the combined use of both quantitative and qualitative data. The use of mixed-methods is necessary due to the diverse types of data available and accessible in each case, which require different methods for the analysis (see Chapter 3 for further detail of the methods and data used for analysis). The use of mixed-methods along with different types of data is also essential due to a methodological reason. This methodological approach of analysis provides alternative or complementary explanations to the evidence from different sources. It also helps neutralise possible biases and limitations that may be inherent in a single research approach and method (Hantrais 2009). The possible biases and limitations include, for example, a small number of participants in the interviews, subjectivity in the interpretive approaches of analysis and immeasurable aspects in the positivist approach of analysis. In short, this methodological approach helps reinforce the validity and reliability of the analysis by crosschecking the findings drawn from different sources of evidence with different methods.

1.5 Limitations of the study

This study involves several limitations to which attentions should be paid when using the findings as references or for further studies. The most essential points are listed below.

- This study takes only two case studies for the cross-national comparison and three case studies for the sub-national comparison. This is due to the time and resource limitations. Generalisation of the observations is, however, essential for the development of the conceptual framework proposed in this work to understand the significance of cultures in determining territorial management outcomes. It is, therefore, important to be aware of the possible shortcomings created by the small number of case studies and also the small number of respondents in the interviews.
- The analysis of cultures at the cross-national level is based primarily on secondary data. The existing data on cultural values in various research projects, however, does not precisely reflect the cultural dimensions in relation to floodplain management in particular. This limitation regarding data availability may result in deviations in the interpretation and classification of management cultures in the case studies. This possible impreciseness of interpretation is minimised by using triangulation techniques. This is done by using both quantitative and qualitative methods for analysis based on various sources of evidence. The classification of conceptions and management approaches for each dimension of culture is also based on analysis of several parameters.
- The study may be associated with biases created in the interpretation processes due to two main issues. First, it is difficult to get secondary data that is perfectly comparable for all case studies. The data may be collected and/or interpreted differently in different places. To make the existing data comparable, a degree of interpretation and adaptation for analysis of the data is necessary. This limitation may result in biases possibly created by the researcher's interpretation of the data. Second, biases may occur in the processes of collection and analysis of the primary data based on the interpretive research activities. This includes, for instance, the interpretation of the interviews. To minimise those shortcomings, the combination of various sources of evidence and different methods for analysis is employed.
- The analysis of the two urbanised delta regions in this work is undertaken at different levels of detail. This is due to limitations of time and resources. Due to the fact that the author is a native from Thailand, this research project takes this as an opportunity to investigate the aspects of culture of the Thai case more in-depth than the Dutch case. However, it is suggested that a similar degree of detail of the analysis of the Dutch case should be also investigated by a native Dutch researcher in the future. This is in order to improve the level of comparability between the two cases and to help improve the validity of the findings.

2 Understandings of culture in the context of territorial management

This chapter reviews selected concepts, ideas and theories in spatial planning, anthropology, and management and organisational sciences that are relevant for characterising territorial management from the point of view that culture is taken as a central concern. Understanding this issue from a trans-disciplinary perspective is crucial. This is because although there has been rising attention on the significance of cultures in territorial management processes for many decades, a framework for understanding influences of culture on determining planning practice and development outcomes that goes beyond an analysis of planning systems is still rather limited (Knieling and Othengrafen 2009b). Through the critical reviews of the selected literature, this study aims to gather notions that are useful for the development of an integrative conceptual framework for understanding the relevance of culture to territorial management processes with a broader view than what is presently offered in the field of spatial planning.

The review in this chapter consists of three parts. The first part reviews selected literature that proposes frameworks for understanding planning cultures in the spatial planning discipline. The second part reviews selected approaches to read, extract, characterise and compare cultures available in anthropology and organisational sciences. This part aims at providing a broader scope of knowledge to understand the expressions of cultures and their connection to territorial management. The third part reviews approaches and frameworks to understanding relationships between culture and territorial management process from institutional perspectives. The review in this part emphasises how culture influences decision-making and institutional arrangements in territorial management. At the end of the chapter, these notions about culture and its relation to territorial management are briefly summarised. They are integrated and form a fundamental theoretical framework in this study to understand the roles and influences of culture in territorial management processes, as elaborated later in Chapter 3.

2.1 Views and understandings of 'culture' in the spatial planning discipline

Since the 1960s, there have been rising concerns amongst scholars in the spatial planning discipline on the importance of culture as one of the essential elements affecting planning practice. In the recent planning literature on cross-cultural comparative study, two relevant terms that are essential to the understanding of cultures in the field are distinguished. They are 'planning system' and 'planning culture'. The term 'planning culture' has been particularly prominent in planning literature for the past 20 to 30 years. Earlier, comparative studies about planning had primarily emphasised planning in the sense of being the responsibility of the state, especially on the decision-making environment of planning processes and different planning styles (referring to formal institutions that are expressed in the form of planning systems). However, many studies (such as Friedmann 2005b and Reimer and Blotevogel 2012) have shown the limitations of this approach based on the analysis of planning systems to explain planning practices. This coincided with the increasing dominance of post-modernism propositions since the 1970s, which have highlighted the contextual-dependent perspective on planning in the form of 'planning cultures'. The main aspect that distinguishes the two perspectives in understanding planning processes is that the planning culture perspective includes both formal and informal institutions, which entails a broader understanding of the range of planning activities that take the emphasis off formal institutions in the planning system perspective (Reimer and Blotevogel 2012). Below, how each perspective looks at cultures in the spatial planning context is elaborated.

2.1.1 'Culture' from a planning system perspective

Friedmann was amongst the first who proposed a conceptual framework for the analysis of planning behaviour to explain the importance of cultural contexts for planning. His framework classified cultural context into three types (Friedmann 1967). The first type is the rationally-bounded culture, which refers to structural conditions (referring to organisational and institutional arrangements) that determines the scope, content and procedure of planning processes. The second type is non-bounded rationality, which refers to the ideological and normative thoughts of planning. This is expressed in forms of, for example, objectives and principles that planning aims to meet. The third type is extra-rational thought, which includes traditions, intuitions and wisdom.

Apart from that, various scholars (such as Davies *et al.* 1989 and Newman and Thornley 1996, as referred in Nadin and Stead 2008) have also developed frameworks for analysis that are based primarily on the investigation of formal institutions and put them into operation to compare planning styles amongst countries in Europe. The EU Compendium of Spatial Planning Systems and Policies (CEC 1997) is a good example. It employed a set of criteria to identify so-called 'ideal types' of planning traditions from a planning system approach. The criteria were based mainly on the legal and administrative systems within which planning operates along with six other variables. These variables are (i) the scope of the system in terms of policy topics covered, (ii) the extent of national and regional planning, (iii) the locus of power or relative competences between central and local government, (iv) the relative roles of the public and private sectors, (v) the maturity of a system or how well it is established in government and public life and (vi) the apparent distance between expressed goals for spatial development and outcomes (Nadin and Stead 2008). Nadin and Stead (2008) proposed this approach to explain planning systems in 15 EU member states in 1997 using four ideal types of planning traditions.

Despite its emphasis on the analysis and classification of formal planning activities, the classification of planning in the member states based on the above approach is observed to conform strongly to the classification of the member states into welfare state types using different sets of criteria. These other criteria include de-commodification used in Esping-Andersen (1990), poverty rates in Ferrera (1996) and Korpi and Palme (1998), basic income levels in Leibfried (1992) and social expenditure in Bonoli (1997) and Korpi and Palme (1998). This likely shows a correlation between models of society and ideal types regarding planning. This correlation is also present in the classification of families of nations in Lalenis *et al.* (2002), which was based on the legal and cultural contexts of nations.[1]

1 The authors classified nations into 'legal families' based on private laws and public laws. The classification of 'cultural families' was based on three existing approaches, using (i) religions, languages and ideologies according to Samuel Huntington (which were termed as different 'civilisations'), (ii) the existing concepts in cross-cultural studies such as the five dimensions of organisational cultures proposed by Geert Hofstede and the value orientations in the World Values Survey and (iii) family structures with respects to authority relations between generations and equality between brothers proposed by Emanuel Todd. See Lalenis *et al.* (2002) for further references.

Nadin and Stead (2008, 35) explained that the conformity of the results derived from different classification approaches by arguing that '*... the form and operation of planning systems are embedded in their historical context, the socio-economic, political and cultural patterns that have given rise to particular forms of government and law. Underlying the contextual differences is the social model*'. This argument is also supported by Friedmann (2005a, 184), who mentioned that '*... even as it [planning culture] draws upon the contributions of other societal actors, it is deeply embedded in the political culture of the country and/or individual cities and, as such, is always historically grounded.*'

The observations above suggest a strong relation between informal and formal institutions in the context of planning in western countries. This idea of a strong relation between informal and formal institutions is strongly supported by de Jong and Mamadouh (2002, 22), who stated that '*[t]ogether, formal and informal institutions make up the whole of the institutional complex, which is to say the rules of the game with the practices around them*'. They also indicated that tensions between formal and informal institutions are at the core of the study of policy transfers. However, the current understanding of how these two elements are related and influence planning practices is rather limited. This reveals the need to better understand 'formal institutions' and 'informal institutions' and their interactions in order to arrive at a profound understanding of the practice of spatial planning (Reimer and Blotevogel 2012).

Additionally, the applicability of the existing approaches to classify and connect planning systems and models of society in Non-Western countries is still limited. There exist a framework support that purpose, such as a framework proposed by Zweigert and Kötz (1977). This framework proposes a way to classify Non-Western countries into three families of nations based on their religious/belief systems (or the so-called 'private laws' approach). They are (i) the (ex) Soviet or Communist system, in which the communist ideology was predominant (ii) religious or theocratic legal systems (such as Islamic and Hindu), in which modern laws are interpreted in accordance with the content of holy books, and (iii) the Confucian legal system, which is a system that suggests modes of living and moralities rather than a legal system. Nevertheless, this method of classification for Non-Western countries appears inapplicable for classifying a great number of countries, including for example some countries in Southeast Asia and Africa that do not fit into any of those three families of nations. This shows a need for developing a cross-cultural comparative approach in the planning discipline that can be used for analysis in Non-Western countries as well.

2.1.2 'Culture' from a planning culture perspective

As aforementioned, there have been several studies proposing approaches to compare planning systems in relation to cultural aspects using planning characteristics and their influences on spatial planning systems. However, this approach based on a 'planning system' perspective of analysis emphasises the formal structures of spatial planning (including the legal background and structure and the planning instruments). This emphasis poses limitations of this approach for understanding influences of cultures in planning practices at a broad level. This is because planning practices are bound to situation-specific contexts, which includes not only professional practices but also the experiential knowledge of actors. The increasing realisation of the limitations of the planning system perspective to explain planning practices in different parts of the world has brought an integrated approach to understanding planning from a 'planning cultures' perspective to the forefront of discussions in the planning discipline. This new perspective adds the consideration of how ideological and normative values influence the shaping of planning practices in a traditional approach.

The term 'planning culture' has been widely used by many scholars in recent literature (such as Friedmann 2005a, Knieling and Othengrafen 2009b, Reimer and Blotevogel 2012 and Othengrafen 2012) to explain an integrated consideration of 'formal institutions' and informal institutions' in spatial planning. Friedmann (2005a, 184) defined 'planning cultures' as '*... the ways, both formal and informal, that spatial planning in a given multi-national region, country or city is conceived, institutionalized, and enacted*'. This referred to cultural context not only at the level of collective choice rules, but also at the level of ideological and normative thoughts. He asserted that the way planning is executed in each place is historically grounded, yet, '*... within any given setting, planning must continuously reinvent itself as circumstances change*' (Friedmann 2005b, 29).

This new approach for analysis of planning suggests looking at planning from an evolutionary perspective. In other words, 'planning culture' is considered as the result of dynamic and context-dependent processes, and at the same time a conditional element of future actions in these processes. This approach has been widely supported by many scholars in recent years, such as Sanyal (2005), Reimer and Blotevogel (2012) and Othengrafen (2012). Reimer and Blotevogel (2012), for instance, argued that 'traditions of planning action' are subject to changes through processes of decision-making, evaluation, learning and adaptation, which are influenced by interactions between individual and collective forces.

This dynamic approach on analysing planning has been claimed to better reveal transformation processes in planning systems and the implications for planning practices. One of the reasons is that the context-dependent approach for analysis

promotes an analysis of planning that goes beyond national-based approaches. It stresses the significance of spatial considerations in planning, which appears to be essential in emerging contexts where the scope of territorial management is not limited to national and regional authorities. This can be observed in inter-regional planning, for instance. On the counter current, planning has also scaled down to the localised level of community planning. This approach also helps to explain the internal variation of planning actions at the sub-national (local) level, in which the influences of national planning systems are still inclusive (Reimer and Blotevogel 2012).

There have been attempts (such as in Ernste 2012, Lalenis *et al.* 2002 and Knieling and Othengrafen 2009a) to find a more solid way to uncover planning cultures, with the aim to help planners better understand the effects of cultures on planning practice and development outcomes as well as to provide a common framework for comparative studies in the planning discipline. The conceptual framework for analysis proposed by Othengrafen (2012) is an example of an attempt to integrate sets of knowledge that are available across different disciplines. Othengrafen suggested that there are three dimensions that essentially characterises what he calls a 'culturised planning model'. These dimensions are 'planning artefacts', 'planning environment' and 'societal environment' (see further explanation of the model in Section 2.2.1).

Othengrafen (2012) argued that these three dimensions are expressed in forms of manifest and non-manifest cultural elements. The parameters for classifying ideal types of planning used in the EU Compendium of Spatial Planning Systems and policies (CEC 1997) are the manifestation of planning environments and planning artefacts, which are symbolic representations of the non-manifest societal environment. A significant societal environment that was emphasised by many scholars, such as Friedmann's (2005a) and Reimer and Blotevogel's (2012), as a significant element contributing to the shaping of planning practice is power relations. Much of the literature mentioned earlier take planning artefacts and planning environments as the centre of their analysis. These include literature related to the understanding of culture from either a planning system perspective or a planning culture perspective. Yet, they fail to include a broad scope of societal environments. This calls for the development of a framework for analysis that also includes the analysis of the roles of societal environments in planning practices.

2.1.3 Reflections on the existing views and understandings of culture in the spatial planning discipline

The review of the selected literature shows that there are a number of plausible conceptual frameworks that suggest how cultural settings influence planning practices. Despite the different terms used by these frameworks, they share a common ground. They share the idea that planning culture is grounded to or influenced by a broader societal context than by formal structures of planning only. Societal context involves traditions that have rooted and evolved in a particular place or society through history under dynamic processes of societal changes. It shows that all frameworks recognise the importance of understanding underlying perceptions when analysing planning procedures and practices in a comparative study. These underlying perceptions refer to informal forms of institutions, which referred to here as 'culture'.

These existing frameworks provide a conceptual framework for how cultures in regards to planning or territorial management can be characterised and made comparable, which is useful for this study. However, to use these frameworks in this study, there are still three main points that if incorporated in the development of conceptual framework could then help improve the understanding of the relevance and significance of culture in spatial planning in a broader context of analysis. The first point relates to the development of a common approach that enables an analysis of planning in different contexts other than Western contexts. The second point regards development of a framework that explicitly includes non-manifest cultural elements in the analysis. The third point regards development of a framework that includes the dynamic dimensions of planning cultures and territorial management from a broader scope, which involves also activities of other actors than those of professionals. This dynamic approach of analysing planning in relation to cultural aspects is of special significance, when planning around the world is facing great challenges created by rapidly changing contexts for development, which call for institutional adaptations. The understanding of the interdependency of planning and culture from a broader perspective is necessary because it may help to explain what have been considered to be flaws in planning, especially in contexts where the role of the public sector is marginal.

In order to achieve the above points of concern, reviews of existing notions and theories in other disciplines appear helpful. These disciplines include, for instance, anthropology in relation to cultural studies and organisational management research and political sciences from an institutionalist perspective. They are elaborated in the subsequent sections.

2.2 'Culture' from anthropological perspectives

As mentioned in the previous section, there are several points that require further development in order to develop a framework for characterising and compare cultures in regards to territorial management; so that the significance of culture in spatial planning could be better understood. These include a framework to uncover non-manifest cultural elements in spatial planning in a way that facilitates comparative studies and a framework that is applicable for studies in various cultural settings. This development could be achieved by bridging existing notions and understandings of the subject in cultural studies and organisational science. The relevant literature reviewed here include the dimensions of organisational culture proposed by Hofstede and Hofstede (2005), the group-grid cultural theory (Douglas 1992) together with its applications in the environmental and resource management, and the frameworks to understand dynamics of cultures from selected anthropological approaches (such as Gullestrup 2006 and Douglas 1992). They are explained as follows.

2.2.1 Definitions and expressions of cultures

Generally, there are two main approaches to understanding culture – i.e. the attitudinal and the inclusive approaches. The attitudinal approach views culture as the aggregate of mental products of individuals where cultural differences are bridged by unifying institutional settings or governance culture (Thompson *et al.* 1990; Hoppe 2007). For this group, culture is expressed in forms of values, beliefs, norms, rationalisations, symbols and ideologies. The inclusive approach sees culture as '*... total ways of world making, with an institutional theory of multiple equilibrium, in which different cultural contexts have opposing effects upon the thoughts and actions of the individuals. Individuals are seen in the context of prior social solidarities and institutions*' (Hoppe 2007, 290). In simple terms, culture for this group is shaped through interactions amongst individuals in a society which consists of various cultures competing with one another.

Thompson *et al.* (1990) integrated these two approaches into a more comprehensive approach for cultural analysis, with three distinguished terms - cultural biases, social relations, and ways of life. 'Cultural bias' refers to shared values and beliefs. This 'cultural bias' is an underlying factor forming the culture of a given society from the attitudinal approach. 'Social relations' are defined as patterns of interpersonal relations. This element plays major roles in shaping culture from the inclusive approach. Thompson *et al.* (1990) argued that these two elements are reciprocal, interacting and mutually reinforcing; together, they generate a distinctive way of looking at and acting

in the world, namely a 'way of life'. It gives a meaning to culture as being influenced by both interactions between the intrinsic values of individuals and collective forces, in which together they form particular cognition and actions in a given context.

In spatial planning, the influence of collective forces, especially those manifested in a form of formal institutions, has been emphasised. However, in order to understand territorial management processes, an understanding of the non-manifested part of culture that also includes individual dimensions of culture appears to be essential. This is based on the above definition of culture proposed by Thompson *et al.* (1990). These notions are found in anthropological research in a form of a framework for understanding relations between the non-manifested part of cultures embedded in the human mental programme and the observable forms of cultural manifestations. This is supported by Hofstede and Hofstede's (2005) argument that culture cannot be observed directly; what we can see is its manifestation in human behaviours.

These two parts of culture expression is present also in Gullestrup's (2006) proposed framework for cultural analysis and understanding. He argued that there are two fundamental forms of culture, according to their expression. One form is manifested and can be perceived (though at different degrees). This perceivable part refers to (i) formalised norms and rules (such as laws and regulations), (ii) both formal and informal structured forms of interaction through, for instance, social structures, economic structures, political and administrative structures, language and communication and (iii) productions in the form of process of interactions and of materialised and immaterialised cultural artefacts (such as craftsmanship and rituals). The other form is non-manifested, functioning as a 'core culture', which constitutes the manifestation of the perceivable part. The core culture refers primarily to informal rules, values and norms shared by a given community, such as religious principles or deep-rooted societal values and silent language (meaning of between-the-lines).

This framework for extracting cultures is rather useful for this study. Yet, it is still quite abstract and general. Knieling and Othengrafen (2009a) further developed these abstract frameworks and notions by integrating them with other relevant frameworks and created the 'culturised planning model', as shown in Figure 4. It is a conceptual framework for cross-cultural comparative research that was made specifically for the spatial planning discipline. The authors suggested three components for the investigation of planning cultures, which are planning artefacts, planning environment and societal environment. These three components are the regrouping of the vertical cultural layers suggested by Gullestrup (2006), in order to make them better fit for the analysis of cultures in the spatial planning discipline. They also correspond to Schein's (2004) differentiation between three levels of culture - the levels of artefacts and symbols, norms and values, and basic assumptions -, which are characterised by the degree of visibility to an observer.

'Planning artefacts' refers to visible planning procedures, structures and processes. This includes, for instance, urban structures, development plans and strategies and planning institutions. 'Planning environment' and 'societal environment' refer to cultural assumptions and values, which are not immediately visible but significantly influence the production of planning artefacts. Their difference is that 'planning environment' refers to assumptions and values that are specific to actors directly involved in planning (such as planners and other stakeholders involved in planning processes), whereas 'societal environment' refers to more general values embedded in the society that function as underlying unconscious assumptions affecting planning (Knieling and Othengrafen 2009a). Planning environments can be observed from, for instance, planning instruments and procedures, objectives of the plan, formalised rules in the form of laws and regulations, and economic, political, administrative and organisational structures. Societal environment is expressed in the form of, for instance, self-conceptions with respect to specific aspects, socio-economic-political models and fundamental philosophy of life.

Figure 4
The 'culturised planning model'
Source: reproduced from Knieling and Othengrafen (2009b, 57)

This 'culturised planning model' was applied to explain planning cultures in different countries, such as in Germany and Finland (Othengrafen 2012). The empirical investigations in Othengrafen's (2012) work show an applicability and usefulness of this model for identifying important planning characteristics and spatial patterns. It also provides a clear framework for uncovering relevant cultural and societal preconditions

that lie below the surface and underpin planning structures and processes in different cultural contexts. It indicates clearly both immediately-visible and non-immediately visible parts of cultures in planning. These points of the framework are very useful for the development of the framework for analysis in this study.

However, the model has three major limitations for the purpose of this study. First, the model does not explicitly address a clear and fixed set of tangible parameters from which societal environment could be extracted. This missing element is essential to understanding planning culture in a broader sense as 'territorial management culture', which incorporates also cultures of other actors than planning professionals. Second, the model primarily considers cultures as taken-for-granted shared values and beliefs. It does not sufficiently address or suggest a way for investigating the 'social relation' dimension of cultures, which involves interpersonal relations that also influence the 'way of life'. This missing dimension is crucially important for understanding of the role of cultures on the shaping of territorial management styles and spatial development outcomes from a relational perspective. Third, the model does not connect culture to the physical settings in which cultures are developed. This issue is important as '... *culture is more or less dependent on both the social and natural environments, and it will impact on this environment in varying degrees*' (Gullestrup 2006, 102). Thus, understanding cultures not only in relation to societal environments, but also to physical environments is essential, especially in the spatial planning discipline. Part of these overlooked dimensions is available in the other theories about culture that are elaborated in the following sections.

2.2.2 Dimensions of culture in management and organisational sciences

One of the approaches to characterise cultures, which has been widely applied to a number of cross-national comparative studies, is the five dimensions of organisational cultures devised by Geert Hofstede from the surveys of organisational cultures he did for IBM. The five dimensions are power distance, individualism versus collectivism, uncertainty avoidance, masculinity versus femininity and long-term versus short-term orientation. Hofstede (2011) argued that '*[c]ultural differences can be found at many different levels, professional, class and regional, but it is particularly potent at the national level because of generations of socialisation into the national community*.' The discrete set of dimensions helped reveal cultural differences and their different actions to common problems in modern nations.

These dimensions of cultures have been applied to various fields of research, especially organisational management in business. They are considered to be also useful for research about cultures in spatial planning, especially in relation to environmental

and natural resource management. This is because the relationship between culture and natural environment was clearly mentioned in Gooderham and Nordhaug (2001, cited in Hofstede 2011) namely that '*[t]he core differences in values between cultures go back to questions of what works for ensuring survival in relation to the natural environment. The Dutch cope with flooding, the Swiss with avalanches, the Russians and the Finns with long, cold winters.*' Nevertheless, the degree of relevance to each dimension may vary, depending on the issue of interest.

Only three dimensions are considered most relevant to the subject of floodplain management, which is central for empirical investigation in this work. The first dimension is power distance. It refers to the extent of equality regarding the power distribution amongst members of a nation (Hofstede and Hofstede 2005). This dimension is strongly relevant to this work because it connects to power structures, which was argued for by many scholars in the planning discipline (such as Friedmann 2005a and Reimer and Blotevogel 2012) as an element that significantly contributes to planning cultures. The second dimension is individualism-collectivism, which refers to the emphasis on individual goals versus societal achievements (Hofstede and Hofstede 2005). It is also strongly relevant for understanding the management of resources, including land and water management. Understanding the dimension of individualism-collectivism is helpful for identifying how people in a society perceive social relations in connection with the resource and possible management approaches they would employ. The third dimension is uncertainty avoidance. It refers to the extent of comfort which the members of a society feel in situations that are novel, unknown or different from what is usual (Hofstede and Hofstede 2005). The relevance of the uncertainty avoidance dimension to this study refers not to the degree of comfort towards uncertainty in organisation management, but rather to the uncertainty created by natural disasters (referring to floods in this case).

The use of dimensions of culture in studies regarding management/organisational cultures ranges from the application of a single dimension to a set of dimensions to construct management typologies. Its latter use is especially useful for comparative studies, because it simplifies a great variation of cultures into a manageable number of management types, to which significant differences are highlighted and minor variations can be subtly indicated. One of the most renowned conceptual models that use a set of dimensions of culture to explain models of society is the 'group-grid cultural theory' introduced by Mary Douglas (1970), a renowned anthropologist and important contributor to organisational theory. Its wide application in the research in public policy analysis and environmental management (such as Wildavsky 1987, Jordan and O'Riordan 1995, Thompson 2000 and Roe 1998) shows the value for this study. The model offers a simplified approach to classifying societies into four different types, based on two dimensions of culture.

'*Group-grid cultural theory is a way of thinking about culture that draws the social environment systematically into the picture of individual choices*' (Douglas 1992, xi). The theory distinguishes between internal structures called 'grid' and external structures called 'group'. Group, presented as the horizontal axis, indicates the level of social contact or relations between members in a social unit, which implies the degree of inclusiveness in a collective sense. Grid, presented as the vertical axis, indicates equality in social transactions and level of control, whether it is primarily based on binding rules or negotiations (Thompson *et al.* 1990). Combining the group and grid dimensions offers a framework for classifying societies into four types of relationships. Thompson *et al.* (1990) later refined the group-grid cultural theory by adding the fifth type to the four types in the original group-grid cultural theory (see Figure 5), which is the autonomous type that was called 'hermit'. Hermit refers to '*... one in which the individual withdraws from coercive or manipulative social involvement altogether... the hermit escapes social control by refusing to control others or to be controlled by others*' (Thompson *et al.* 1990, 7, 10). This fifth way, with a self-sufficiency way of life, is less existent than other four types, but it is relevant for understanding some types of society, such as those strongly influenced by Theravada Buddhism of which self-sufficiency is one of the underlying principles.

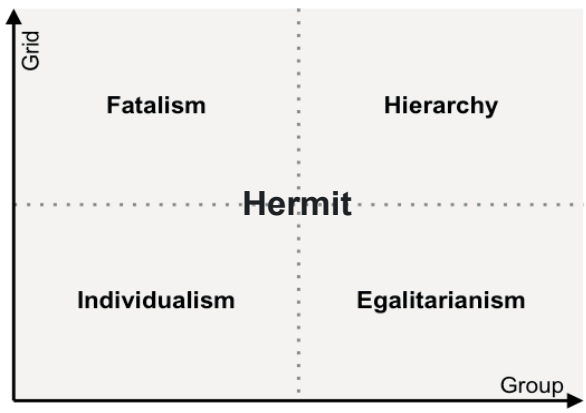

Figure 5
Five ways of life classified according to the refined group-grid cultural theory
Source: Adapted from Douglas (1992) and Thompson et al. (1990)

The fatalism type refers to a society without any group membership to sustain individuals with strong controls. The hierarchism type refers to a strongly governed society with positional rules in which all roles are ascribed and all the constituent groups contained within a comprehensive larger group. The egalitarianism type is a kind of community that also features a strongly bound group with no ranking or grading rules for the relations between its members. That means each individual is equally positioned. The individualism type refers to a non-bound society where the individual only concerns about their private benefits (Thompson *et al.* 1990).

The group and grid dimensions strongly correspond with the individualism-collectivism and the power distance dimensions in Hofstede and Hofstede's (2005) five dimensions of organisational cultures. This shows a strong plausibility for using these dimensions of cultures to construct a simple conceptual tool to characterise and compare different types of human-human relationships, which present ways of social transaction in territorial management.

Apart from aspects of management regarding social transaction, culture in territorial management includes also aspects in relation to the management of resources. Douglas (1992, 146) argued that what counts as private or collective goods does not depend on the kinds of goods, but on the kinds of communities. This implies that in order to understand culture regarding territorial management, it is essential to also understand how a society conceives of and behaves in relation to the management of their resources. Several scholars (such as Roe 1998, Thompson 2000 and Tabara and Ilhan 2008) have refined and applied the group-grid cultural theory to explain the ways of managing natural resources and environment, based on an assumption that how ones conceive and behave in relation to other people (social transaction) implies or is strongly connected to how they develop their conceptions and interactions with nature.

Thompson (2000) identified five types of perceptions of nature in conjunction with the five ways of life. For individualists, nature is benign and is able to recover from any exploitation. For egalitarians, nature is fragile, intricately interconnected and ephemeral. For hierarchists, nature is tolerant and is stable until pushed beyond discoverable limits. For fatalists, nature is capricious and has no clear principles. For hermits, nature is resilient and always provide for sufficient needs. These different perceptions are argued as resulting in distinct conceptions of the human-nature relationship and environmental management strategies as summarised in Figure 6.

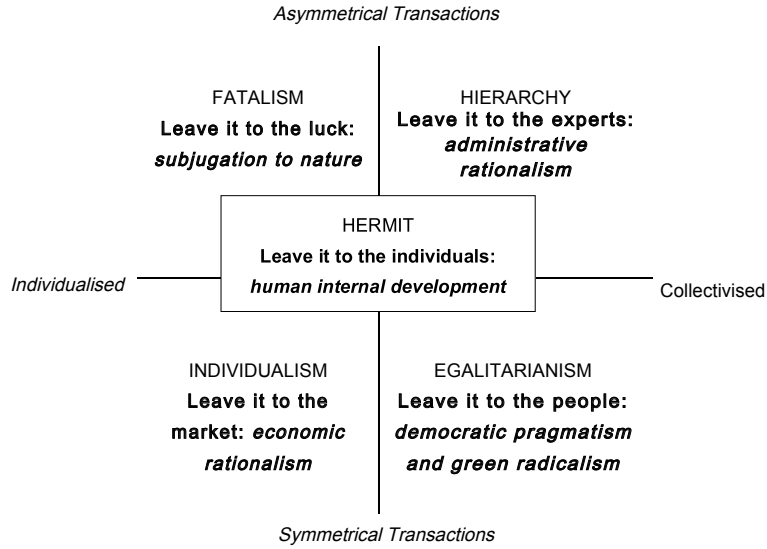

Figure 6
The connection between the five ways of life, their corresponding perceptions on nature and the environmental management strategies
Source: Adapted from Dryzek (1997), Roe (1998) and Thompson (2000)

Individualists relate to the nature with an underlying principle that all resources exist for humans to exploit (Tabara and Ilhan 2008). As a result, they tend to encourage bold experimentation in the face of uncertainty (Thompson 2000). Dealing with environmental issues for this group is to manage institutions through market mechanisms, or so-called 'economic rationalism' management approach (Dryzek 1997).

- Hierarchists also exploit the natural resource like the individualists, but with an underlying principle that nature has limits and humans should not exploit it beyond discoverable limits of nature (Thompson 2000). Thus, their management strategy is to ensure that exuberant behaviour never goes too far with the underlying principle that resources can be managed but not needs (Roe 1998). For this group, technocratic determination with trustworthy institutions is necessary for environmental management (Thompson 2000). It seeks to organise scientific and technical expertise into a bureaucratic hierarchy in the service of the state, which can be called as *administrative rationalism* (Dryzek 1997).
- Egalitarians conceive of the human-nature relationship as living harmoniously with nature, with the underlying principle that humans and nature are all equal and no real distinction between humans and nature can be made (Tabara and Ilhan 2008). Thus, they tend to encourage voluntary simplicity with the precautionary principle with the underlying principle that nature is fragile and all living beings should be treated equally (Thompson 2000). Their management strategies are corresponding

with *green radicalism* and *democratic pragmatism*, which is to encourage piecemeal problem solving, usually through a series of rough compromises among the different actors concerned with an issue (Dryzek 1997).

- Fatalists conceive of humans being subjugated to nature, with the underlying principle that nothing can be done to nature, which is capricious (Tabara and Ilhan 2008). Their idea is that neither needs nor resources can be managed (Roe 1998) and thus there is no substantial way for humans to ever become in sync with nature (Thompson 2000).
- Hermits relate to nature with an underlying principle that both needs and resources are perceived to be manageable (Roe 1998); '*... for those whose needs are slight (and whose time horizons are short), nature will always provide [i.e., be resilient]*' (Thompson *et al.* 1990, 47). Thus, they tend to live in harmony with nature through a *human internal development* strategy, by encouraging learning processes between human and nature aimed at configuring one's needs and resources so that they coincide in self-sufficiency and autonomy (Roe 1998).

In summary, administrative rationalism and democratic pragmatism are alike in that both take the structural status quo of liberal capitalism as a given and place nature as subordinate to human problem-solving efforts. They are, however, very different in terms of their views on government. '*For democratic pragmatism, government is treated not as a unitary state, but rather as a multiplicity of decision processes populated by citizens*' (Dryzek 1997, 95), whereas for administrative rationalism '*... government is the administrative state, treated in monolithic terms, ... [and] therefore not about democracy, but about rational management in the service of a clearly-defined public interest, informed by the best available expertise*' (Dryzek 1997, 74). For economic rationalism, it turns out to depend on administrative rationalism, in which experts with public interests are included as important actors in management of nature (Dryzek 1997, 102). When it comes to institutions, economic rationalism, however, has had much less impact than administrative rationalism and democratic pragmatism on governing issues (Dryzek 1997, 116). Hermits and individualists seem to be alike, as both needs and resources are perceived to be manageable. Yet, unlike the individualist who seeks to maximise the use of resources in order to improve human welfare, the hermit chooses to manage his needs 'to be nestle comfortably inside his resources' (Thompson *et al.* 1990, cited in Roe 1998, 55).

The above review provides thought-provoking perspectives on the possible use of the dimensions of culture that are available in anthropology and organisational science for analysing and understanding environmental and territorial management policy from a point of view that culture is taken as a central concern. The reviews show that the 'group' dimension, which presents the dimension of integration, is applicable to explaining not only the sense of belonging in a social unit, but also a sense of inclusiveness between humans and nature as an integrated system. This applies also to the 'grid' dimension, which presents the sense of authority between members in the

society as well as between humans and nature. However, the elements that influence these sets of values may vary. For instance, in the individualist type of society, the prevalent pattern regarding social contact may not be associated with symmetrical transactions and a low degree of inclusiveness when it comes to the values regarding relationship between humans and nature. Thus, it is suggested to execute separated analyses for each of the two sets of conceptions in relation to territorial management, i.e. for conceptions of the human-nature relationship (which implies resource management types) and conceptions of the human-human relationship (which implies social organisation types), and see whether they are indeed connected.

In addition, there are two fundamental critiques that should be taken into consideration for the development of a framework for analysis in this study. First is the critique on the possible differences of cultural biases/dominance at different levels of analysis. This means in other words that it is possible that policy preferences, institutional ensembles and policy behaviour (such as implementation strategies) may not express common cultural biases/dominance. This possible difference points to the significance of developing a framework for analysis that is attentive to which levels of expression in institutions are analysed. Second is the critique on possible conflicts of cultural bias/dominance between units of analysis at different scales, such as an analysis at the scales of individuals, groups and large human ensembles. This critique raises awareness of the research design regarding the scale of territory for analysis and the methods used to collect data for interpretation.

2.2.3 Understandings about dynamics of culture in the anthropology

In the last 20 to 30 years, the concept of static culture in anthropology has shifted by incorporating more with the dynamic aspects of culture. This is present in recent literature, such as Thompson *et al.* (1990), Douglas (1992) and Gullestrup (2006). This is clearly stated in Gullestrup (2006, 21 and 102) that '*... at a given point in time, and in a given context a unity of individuals will perceive reality and act in their surroundings with a larger degree of homogeneity than they will with people belonging to another unit*'; yet, '*... [a]s the environment is not static, the challenges that confront people of an observed culture will also change continuously. The result of the on-going assessments – conscious or unconscious – of the actual ways in which a given culture fulfils the basic needs of its people will invariably change in the course of time, irrespective of which basic values underlie it*'.

The idea of changes in cultures caused by societal changes was also supported in Thompson *et al*. (1990), but from a slightly different perspective. Thompson *et al*. (1990) argued that any community is constituted by coalitions of several cultures with a dynamic equilibrium. When societies change, cultural bias then cannot make sense of changing contexts. Consequently, actors tend to adjust to the changing contexts by giving way to another way of life that compensates for the limitations of the existing dominant one or by reforming the contexts (Douglas 1992; Thompson *et al*. 1990). In simpler terms, one of the differences between the two perspectives is that harmony across cultural layers and cultural segments within a given context at a given point in time is assumed in Gullestrup's (2006) theory about culture, whereas Thompson *et al*.'s (1990) refined group-grid cultural theory assumes cultural plurality in any society. In addition, culture change from Gullestrup's perspective is an adaptation of an existing culture to cope with changing conditions, whereas it refers to a shift of cultural dominance from one type of cultural bias to another in the refined group-grid cultural theory.

The two perspectives, however, addressed a similar condition that is arguably essential to triggering culture changes. It is that indigenous and exogenous factors are likely to generate different results in culture change. Douglas (1992) argued that if one wants to change a culture, one has to change the conditions that underlie the processes that shape such culture. This is, for instance, by changing organisational structures, reward systems or other large-scale interventions. However, she argued that this change cannot be imposed from outside, but has to be exposed from within. This is because culture is a product of collective actions, which is the emergent result of the continuing negotiations about values, meanings and proprieties between the members of that organisation and with its environment. This was mentioned in a slightly different way by Gullestrup (2006). He argued that cultural changes could be initiated either by indigenous factors or exogenous factors. However, cultural changes influenced by exogenous factors (such as new policy transfers from other cultures) will take place only under the conditions that the new culture conforms to the existing cultures, or at least to the culture of the most powerful actor.

Regarding the issues of institutional transfer, de Jong and Mamadouh (2002) argued that this does not mean that transferability is not necessarily limited to comparable places/societies, but rather that it is necessary that existing institutions are properly taken into account in the process of selecting and adjusting a model to adopt. This aspect of concern is included in Gullestrup's (2006) framework, which looked at whether and in which direction cultural change will take place. He argued that the probability of culture change (P.CC.) is strongly linked to four factors as presented in

Figure 7. Relations between these four factors are explained in the equation below.[2] This fundamental idea is relevant for this study, as the probability of culture change is considered to be comparable to the chance of accepting a policy initiative in practice.

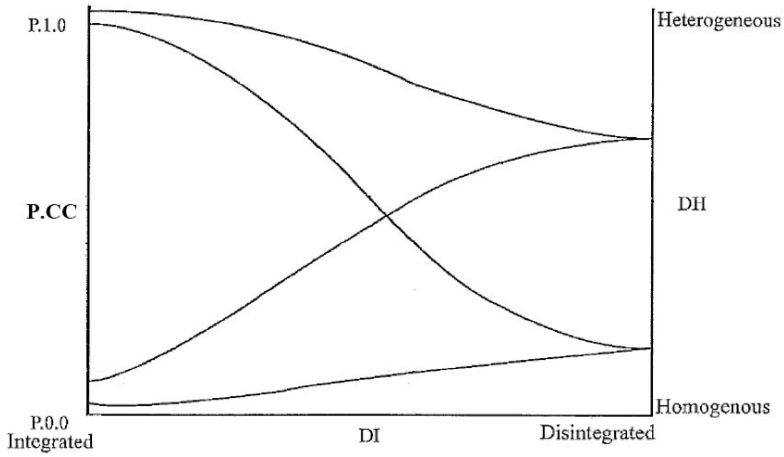

Figure 7
Relational diagram of the variables influencing the probability of culture changes
Source: Gullestrup (2006, 145)

$$P.CC. = f(DH, DI, CiF, CIPR) \qquad (1)$$

Degree of homogeneity (DH) refers to an expression of the breadth and width of the aggregated knowledge and insight into the observed culture. *Degree of integration* (DI) refers to consistency between various core cultures across actors in a given society and the integration of core cultures and their logical reflections in manifest culture layers (or consistency across cultural segments). CiF refers to conformance between the *content of the initiating changes* and the existing cultures. Culture-internal power relations (CIPR) refer to the power of a specific group to determine changes over other groups. The theory suggested a set of implications as follows.

2 According to Gullestrup (2006), there are two levels of culture changes: (i) the initiating changes that may occur to only some layers of culture and within a limited group of the society and (ii) the real changes that take effects to a broad scale in the society across layers and actors. The second one is of the interest in this study.

- A society associated with more diverse knowledge, experience and practical skills (low DH) will provide more chances for the initiating factors to penetrate into and reach a stage, where culture changes can (but may or may not) take place. In the case that the society is greatly homogenous (high DH), the content of the initiating changes (CiF) has to be tailor-made to fit the existing manifest cultures.
- The more integration (high DI) cultures have, the stronger their reaction towards initiating factors will be. If the conformance of the content of the initiating changes (CiF) to the existing cultures is high, culture change is likely to take place, and vice versa if they are not conforming.
- The decisive factor for cultural change to take place in a society with highly disintegrated conditions is culture-internal power relations (CIPR). It means if the potential impacts of the initiating factors are conforming to the cultures of the most powerful actors, culture change is likely to take place.

In summary, the reviews regarding dynamics of culture from the two anthropological perspectives above highlight two major remarks that are useful for theoretical development to understand possible reactions of a society to transferred knowledge and policy (or institutions). First, both theories imply stability of cultures during a particular period of time. However, this stable state is somehow dynamic when considered within a longer span of time. This is because the theories suggest that such stable state is achieved through continuous processes of negotiation between actors in the society. Second, both theories imply that cultural dominance may evolve, as related to changes of underlying conditions that influence the shaping of cultures. However, the notions about cultures provided by the literature reviewed are still rather limited for the understanding of dynamic interrelationships between changes in development conditions and their impacts on culture change. This gap can be filled by notions found in research and studies in institutional sciences. Selected concepts and theories that are relevant to this study are reviewed in the next section.

2.3 'Culture' from institutional perspectives

This section reviews literature that assists approaches to understand culture in relation to its contextual conditions from an institutionalist perspective. The review focuses on selected literature that relates closely to the subject of institutions in relation to management of common and public goods or services. This is because this subject is useful for development of a framework for analysis of cultures in territorial management, especially in the specific context of floodplain management, which is the emphasised issue of the empirical investigation in this work.

2.3.1 Definitions and expressions of institutions

The term 'institutions' used in this study refers to a broader meaning of the term than just organisational arrangement. Ostrom (2005b, 3) defined 'institutions' as '... *the prescriptions that humans use to organize all forms of repetitive and structured interactions at all scales*'. Jordan and O'Riordan (1995, 4) argued that '... *the notion of institutions applies both to structures of power and their resulting organisational forms and to socialised ways of looking at the world as shaped by communication and the patterns of status and association*.' In other words, institutions present socio-cultural values, which are expressed as formal and informal forms of social organisation at all scales.

De Jong and Mamadouh (2002), defined 'formal institutions' as legal rules including, for instance, the agreed upon rules, laws, constitutions and contracts; informal institutions are social practices and rituals based on underlying cultural values, belief systems and norms. It is argued that '*[t]ogether, formal and informal institutions make up the whole of the institutional complex. Without the 'other half' one would either understand just the rules according to the book regardless of how they work out in general patterns of behaviour or just the general patterns of behaviour without knowing if and how they are backed up judicially*' (de Jong and Mamadouh 2002, 22).

These institutionalist views towards the understanding of planning activities and behaviours correspond to the other reviews from the spatial planning and the anthropological views. They are corresponding in a way that emphasises strong interrelations between underlying values (or 'culture') and structured/formal rules as well as influences of these interrelationships on people's decision-making processes. The relevance of this framework to this work is that it shows that in order to understand territorial management processes, it is important to incorporate both formal and informal forms of elements underpinning decision-making processes as well as their interrelationships. The institutionalist perspective offers a framework that is especially useful for this purpose in the spatial planning discipline. This is because of its emphasis on understanding the roles of rules and incentives in development processes and their influences on planning practices and development outcomes.

There are a number of frameworks from an institutionalist perspective that incorporate levels of cultural expressions mentioned in anthropological literature with a slightly different approach. This approach offers frameworks to understand interrelationships between these formal and informal forms of culture by looking at them as expressions at different levels of institutions. It offers a clearly and relevant approach for analysis of public policy. These frameworks include, for instance, de Jong and Mamadouh (2002) and Ostrom (2005b). De Jong and Mamadouh (2002) suggested to analyse institutions based on three levels of action, which are the constitutional level, the

level of policy area and the operational level. This strongly connects to the three levels of rules distinguished by Ostrom (2005b), which are constitutional-choice rules, collective choice rules and operational rules-in-use. It is argued that '*changes in rules at one level occur within a currently fixed set of rules at a deeper level*' (Ostrom 2005b, 58). This implies that the deeper the level of rules, the slower the pace of change is expected to be. Table 2 presents the connection between the three levels according to the frameworks above and the examples of their expressions in policy arena in the formal and informal forms.

Level of Rules	Level of Action	Formal Relations	Informal Practices
Constitutional-choice rules	Constitutional level	Legal systems	Value orientations
Collective choice rules	Level of policy area	Formal regulations	Informal codes
Operational rules-in-use	Operational level	Procedures	Roles

Table 2
Levels of institutional analysis and their expressions in the policy arena
Source: Summarised based on de Jong and Mamadouh (2002, 23) and Ostrom (2005b)

The deepest level - the constitutional level and the level of constitutional-choice rules - refers to grounded rules (such as world views, norms and values) that provide the context in which decision-making processes and relations take place. The second level - the level of policy area and the collective choice rules - refers to the formal and informal forms of social organisation structures, such as the system of legal, political and organisational relations and informal codes. The most surface level - the operational level and the operational rules-in-use - refers to the whole set of exploratory activities, procedures, techniques and administrative forms used by individuals within the conceptual and institutional frameworks. These definitions and frameworks for analysis of institutions are useful and adopted as a major part of the theoretical framework for the analysis in this study.

2.3.2 Dynamics of cultures and institutions in decision-making processes

Scholars from various disciplines, including economists and policy scientists, have put great efforts in developing a systematised framework to facilitate an analysis of social organisation, in which the compilation of empirical knowledge and assessment of past reforms is aided (Ostrom 1998). This aims to improve the governance and management of resources. One of the meaningful products of this contribution is the Institutional Analysis and Development (IAD) framework. The IAD framework focuses on how rules, physical and material conditions, and community attributes shape actions and incentives faced by individuals, and how these conditions combine to determine outcomes. It provides a valid and systematised set of underlying components that helps explain human behaviour within a diverse range of situations in which humans interact.

The framework has proven to be applicable in explaining development situations for a diverse range of topics in various fields at different levels of application. This includes its application to a number of studies in environmental and resource management and territorial planning and governance, such as Ostrom and Jansen (2004), Evans *et al.* (2008) and Smajgl *et al.* (Smajgl *et al.* 2009). The applicability of the IAD framework to explain diverse situations and topics in relation to management of resources shows the usefulness and a promising applicability of the framework for aiding public policy analysis. It enables the operationalisation of a general framework to explain situations in the past in order to identify principal elements influencing territorial management processes. However, as the framework's coverage is much broader than the scope of the study, only selected parts of the framework that are specifically relevant to this study are reviewed.

The IAD framework comprises three basic conceptual components (see Figure 8). They are (i) exogenous variables, referring to the principal elements that condition decision-making, (ii) action arena, referring to the social space where individuals interact and (iii) outcomes (Ostrom 2005b). These three components are interconnected and compose a building block that interacts with other blocks, creating a complex interaction between various action situations. The fundamental premise of institutional changes in the IAD framework is that when outcomes are evaluated by the actors involved as productive or positive, they may increase their commitment to following the current institutions; institutional transformation takes place as a way to change the structure of the situations in the action arena when the outcomes are evaluated as destructive or negative. This process of institutional change refers to an internal process of change. Additionally, rules can also be altered as a result of changes in exogenous variables, which are the main focus of this study. These changes are, for examples, changes in physical conditions, attributes of community or rules-in-use caused by transfers of technology, knowledge, discourse or policy.

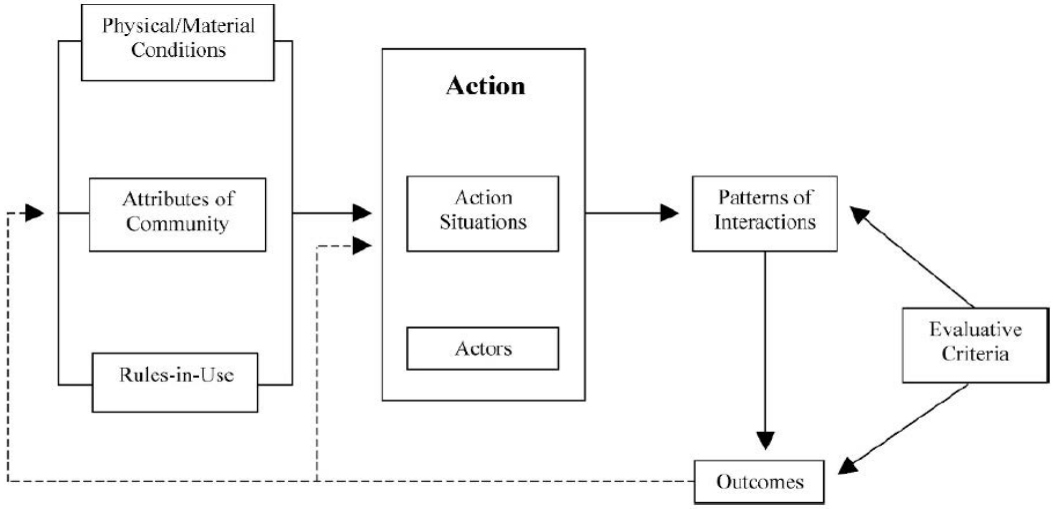

Figure 8
The Institutional Analysis and Development (IAD) framework
Source: Ostrom (2005b, 15)

Exogenous variables are composed of three basic elements, which are physical and material conditions, attributes of community and rules-in-use. 'Physical and material conditions' refer to bio-physical conditions and other characteristics of the resource, such as excludability and subtractability. 'Attributes of community' are frequently referred to as 'culture' (Ostrom 1998). It includes, for instance, behavioural norms and common understandings about the distribution of resources shared by participants in the action arena. 'Rules-in-use' refer not only to frameworks that control possible actions, but also to (dis)incentives for individuals within the group context. It includes both formal and informal rules, denoting regulations, instructions, precepts and principles (Ostrom 2005a). The framework also suggests that rules exist at different levels, referring to the three levels described in Section 2.3.1, which continuously interact and cause continuous processes of institutional change. Yet, '*[c]hanges in deeper-level rules usually are more difficult and more costly to accomplish…*' (Ostrom 2005a, 842).

Different disciplines emphasise different features. As mentioned earlier, spatial planners primary focus on rules and incentives in territorial management processes and their effects on spatial development outcomes. This is because rules are the fundamental unit that planners/policymakers employ to change development outcomes. Nevertheless, to understand territorial management, it is essential that rules be considered in strong conjunction with physical conditions and attributes of community (that is related to cultures). There is a crucial point in the framework that needs to be adapted to fit with the purpose of this study. This study aims primarily at understanding how formal planning institutions affect and are affected by informal

institutions (at different levels). It also aims at investigating the influences of institutions on the shaping of decision-making in territorial management processes. Hence, reclassification of the three exogenous variables is necessary. This is in order to clearly distinguish between formal and informal rules, which in the IAD framework are combined.

2.4 Summary and remarks: relevance of the existing notions to this study

The reviews in this chapter reveal promising uses of existing notions, theories and frameworks in cultural studies, organisational sciences and institutional studies for developing understandings of culture in regards to territorial management and its relevance to spatial planning and public policy. In short, there are three main points addressed in these notions, theories and frameworks that are of interest for this study. First, the theories in cultural studies reviewed here suggest that decisions and actions people make are influenced not only by collective values shared in a given community, but also by interactions between the intrinsic values of individuals. This means that cultural values at the local level may differ from those at a broader level (such as the regional and the national levels). In this study, it is argued that this variation may affect policy implementation and planning practice at different levels. This issue of cultural variation and its influence on territorial management processes is thus considered important for this study and further investigated in the subsequent chapters.

Second, the reviews of literature in cultural studies and institutional studies denote dynamic dimensions of culture resulted by interactions between individuals and its interactions with other development conditions. More precisely, theories in cultural studies suggest simplified ways of understanding cultures from a semi-static approach that takes into consideration possible changes of culture as a result of interactions between individuals. Understandings derived from the institutional studies add other dynamic views of cultural analysis in conjunction with dynamics of development conditions, which enable a relational approach for analysis. This notion enables the analysis to go beyond the understanding of influences of cultures as static taken-for-granted shared values. The frameworks suggest approaches for analysis that incorporate activities created by other actors rather than planning professionals only. They provide analytical approaches that help in understanding the influences of culture on planning practice and development outcomes from a wider perspective than what have been emphasised in the spatial planning discipline. These views of understanding the relevance of culture in territorial management processes are integrated and further developed in the next chapter as a conceptual framework for analysis in this study.

Third, it was observed here that the ways to characterise and understand culture suggested in different disciplines show commonalities. In general, it shows that these theories and frameworks to characterise and understand culture share the idea that culture is visible/expressed at different levels; the deepest level of culture (referring to worldviews and core values) underpins how culture is structured and operationalised in visible forms. The reviews also show that theories and frameworks in each discipline emphasise different aspects of culture expression, but are complementary for understanding the relevance of culture to spatial planning and public policy analysis when they are combined. For the purpose of this study that aims at understanding culture regarding territorial management and its relevance to spatial planning and public policy analysis, theories and frameworks from institutional perspectives are very relevant. This is because they explicitly address and emphasis the aspects of how rules may affect decision-making processes and development outcomes. These aspects, especially regarding the influences of formal rules, are what planners are interested in. Thus, it appears useful for this study to develop a conceptual framework that put rules, both formal and informal ones, at the centre of the analytical concerns. However, the reviewed frameworks in cultural studies and institutional studies also offer rather different approaches in understanding the influences of culture on territorial management processes. These frameworks in cultural studies (such as Gullestrup 2006) propose conducting analyses using factors in the form of conditions that are argued to result in culture changes or the persistence of traditions. On the other hand, those in institutional studies (such as Ostrom 2005a) propose conducting analyses using elements that are argued as influencing development outcomes and institutional adaptation in a form of interrelated elements. Both approaches are integrated in the conceptual framework developed in this work to serve different purposes of analysis, as elaborated in Chapter 3.

3 Research methodology and the proposed integrative conceptual framework

3.1 Methodological premises of the study

As mentioned in previous chapters, existing methods and frameworks that focus primarily on the analysis of planning systems as taken-for-granted sets of expressions of planning cultures do not provide sufficient explanations for planning practices (Friedmann 2005b; Reimer and Blotevogel 2012). The review of literature in Chapter 2 shows that understanding the processes of territorial management by incorporating culture into the analysis from a relation and diachronic perspective is crucial for developing a better understanding of significance and influences of culture in determining planning practices and development outcomes. The reviews also show that an analysis from a relational perspective could be useful for theoretical development of the subject studied. This is because an emphasis of this study is to investigate whether the elements underpinning how culture influences decision-making in territorial management processes at different levels of development are similar; and whether analysis from this perspective offers a context-dependent approach for analysis, which enables an understanding of the relevance of culture in territorial management processes that goes beyond analysis of a so-called 'national culture'.

In order to fulfil the gap describe above, this study develops an integrative conceptual framework and uses it in order to explain and understand the relevance of culture in territorial management processes from a relational and diachronic perspective. In other words, the research is underpinned by a fundamental premise, namely that '*we create society at the same time as we are created by it*' (Giddens 1986, 11). It considers culture not as an absolute taken-for-granted entity, but as socially constructed values influenced by mutual interactions between individual cognition and social framework (Othengrafen 2012).

In order to understand these interactions in a dynamic complex urban system, the structuralist perspective is employed. In this study, the structuralist perspective is used to analyse culture in terms of interrelationships between components and their relationships to a larger system or structure. This analytical approach facilitates the extraction of complex interconnected relationships into a set of relationships between a manageable number of components. It is based on the idea that there are constant laws of abstract culture being constituted by a set of basic components bound to structured relationships. An example of the use of the structuralist concept in this study is the conceptual framework for characterising and classifying cultural traits into ideal types of floodplain management based on a set of dimensions of culture and the assumed interrelationships between culture and other development conditions as well as their influences on planning practice and development outcomes in the context of floodplain management (see Section 3.3 for further detail). In simple terms, this study combines pieces of given information based on several sets of relationships and unpacks them in order to make meaning out of it.

To unpack and create meaning out of several sets of relationships, this research considers the importance of the social construction of reality as an underpinning premise. It takes a view that people may have different interpretations of incidences and thus not predetermine that people's understanding and worldviews are similar. This difference is significantly relevant to culture. In other words, this study takes a research approach that advocates for a multiplicity of ways in which the world may be constructed and interpreted. This calls for interpretive research methods.

However, interpretive research methods are associated with two major limitations for this study. First, the interpretive methods alone have limitations to connect the non-visible parts of culture (which can be analysed by interpretive methods) with some of the visible parts of culture that are best analysed by observation. This connection is necessary for building a better understanding of the elements that make particular cultural traits superior to others. It is also important for understanding how to take these elements into account in policy-making and policy implementation processes in order to promote the desirable outcomes that planning objectives aim for. As a result, it appears necessary for this study to incorporate also the positivist perspective and methods for analysis, in which the knowledge a person holds about the world is acquired through observation (du Toit 2007). The positivist perspective and methods are useful for aiding the interpretation of invisible parts of cultures through observations of the visible evidence, such as physical development patterns and management instruments/procedures taken to deal with flood-related issues.

Second, the dynamics of the system suggested by the social construction of reality perspective, which assumes continuous interchanges in constantly changing societal contexts, pose limitations to policy analysis. Therefore, a framework to facilitate the analysis of possible reactions to a policy that is based on an assumed stable state of culture at a given point of time appears helpful. For this reason, this study proposes two approaches for the analysis of planning policies. They are (i) the synchronic approach for examining the factors affecting the acceptance of policies in practice and (ii) the diachronic approach for understanding interactions between culture and other development conditions and their influences on territorial management processes, especially for spatial planning. The use of these two approaches is summarised in Section 3.2. A detailed explanation of the two approaches and the methods for analysis for each approach are elaborated in Section 3.4 and Section 3.5.

3.2 Overview of the integrative conceptual framework and research methods

An aim of this study is to explore inter relationships between culture, planning policy and territorial management outcomes and examine whether cultures have significant influences in shaping decision-making in territorial management processes. The analysis is carried out using a comparative method with multiple-case studies to seek generalisations from similarities and an explanation of the differences in territorial management outcomes that occurred in different urban development settings. The comparative method is employed in this study because culture can be best understood in a relative form (Hofstede 2011). This study also compares territorial management at different periods of development. This aims at developing a better understanding of the dynamics of the elements presumed in this work as underpinning territorial management cultures and outcomes and their implications for policy-making and implementation.

The empirical investigation is carried out using an integrative conceptual framework developed in this study. Development of the framework is based on existing knowledge and theories in various disciplines reviewed in Chapter 2, including the relevant theories in spatial planning, cultural studies, organisational and management sciences and political sciences. The integrative framework consists of three principal components – A, B and C - as shown in Figure 9.

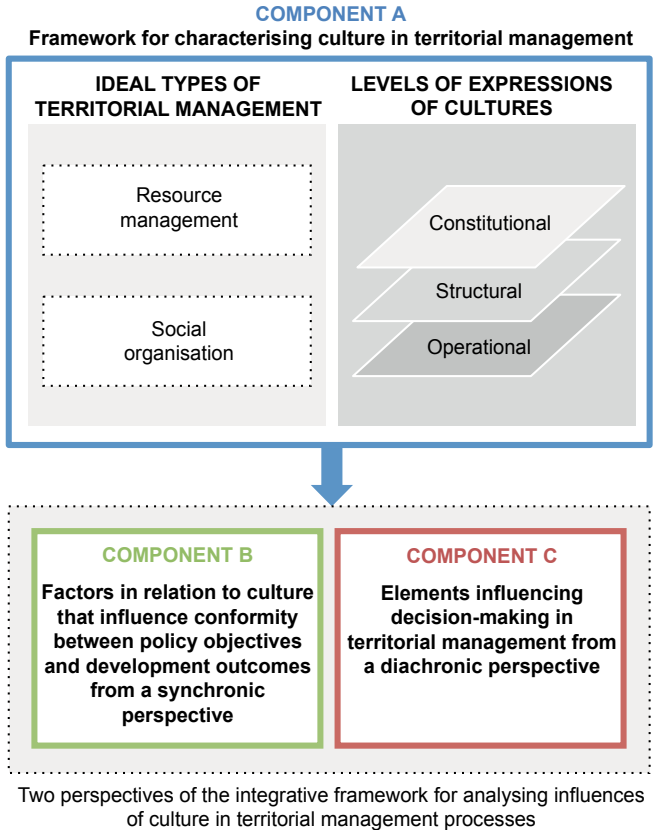

Figure 9
Overview of the integrative conceptual framework

Basically, the three components are used complementarily to serve different objectives of the analyses in the study. Figure 10 summarises the relationships all the three components. Component C is the main core of the integrative framework, as it serves the main purpose of this work to gain a better understanding of the relevance of culture on the processes of policy-making and planning practice as well as its influences on spatial development outcomes. However, analysing this complex and dynamic system by taking into account all the nested interrelationships between multiple factors influencing the processes at once is difficult. This study proposes to split the analysis of these complex interrelationships into several sets of analysis that involve simplified relationships between factors that are to be connected afterwards. Component B is developed to serve this purpose. Component A provides a framework for characterising territorial management culture, planning policy and management outcomes in a form of ideal types. This framework is necessary because ideal types enable and ease the analysis based on the principle of 'conformity' required for analysis using component A and B. Apart from the purpose of facilitating comparison between cultural values, planning policy and

management outcomes, the classification of the management expressions into ideal types also enables a comparison of management approaches across territories, actors and periods of time. A brief explanation of each component and their links are described below.

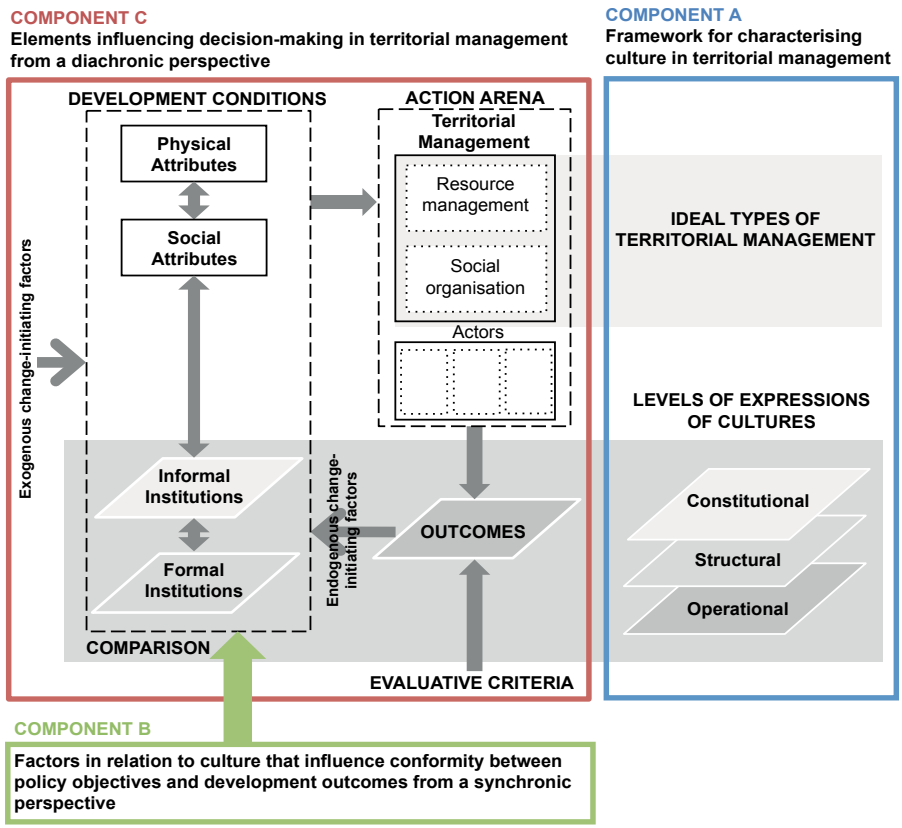

Figure 10
Relationships between the three components of the integrative conceptual framework

Components of the integrative conceptual framework

Component A provides a framework for characterising territorial management in a form of ideal types. It offers an approach that uses culture to explain and understand territorial management. The framework proposes characterising cultures in a form of institutions that are expressed at three levels. The three levels refer to (i) the constitutional, (ii) the structural and (iii) the operational levels of institutions. These three levels of institutions present (i) cultural values, (ii) organisational structure, planning policies, regulations, instruments and procedures and (iii) territorial management outcomes.

The conceptual framework also offers an approach to classify the expressions of territorial management cultures using ideal types based on two management typologies. These typologies are the resource management typology and the social organisation typology. The two management typologies are constructed based on a set of dimensions of culture, which have been widely used in cultural studies and organisational sciences (see Section 3.3.2 for further detail of the management typologies and dimensions of culture). Using existing dimensions used in other studies in different fields helps bridge knowledge across disciplines, which is helpful for improving knowledge regarding the significance and influences of culture in territorial management processes and improving communication across disciplines relevant for planning and implementation of public policy. It also enables the analysis to use the existing database regarding cultural studies available in other disciplines, which helps reduce the time required for this study; yet with limitations and constraints (see Section 1.5).

This component is used in this work for investigating whether territorial management in different urban development settings is conceived, formulated and operated differently. In this work, the specific context of floodplain management is taken as an example to demonstrate how ideal types could be operationalised.

Component B presents a framework for analysis from a synchronic approach that examines whether culture is an important element influencing decision-making in territorial management processes. The analysis focuses on explaining its influences regarding the acceptance of a planning policy in practice. This analytical approach offers a simplified set of factors for understanding relationships between culture, planning policy and management outcomes. It assumes a stable state of the development conditions at a given point in time, or in other words excludes dynamic dimensions of culture in the analysis. The framework provides a set of factors that are argued in this study as significantly determining whether the targeted policy is likely to be accepted in practice by those who are affected by the policy at a given point of time in an assumed stable state of culture and its context (see Section 3.4 for further detail of the framework).

The underlying principle of this framework is based on the concerns about 'conformity' between management types presented in the content of the policy and in the local cultures. The proposed set of factors is used to explain the (non-)conformity between planning objectives and territorial management outcomes. The analysis using these sets of factors gives special attention to the reactions of involved actors to planning policies by taking culture as a central concern of analysis. By connecting the information derived from the analyses of situations in different periods of development, dynamic relationships between development contexts and outcomes can be seen and understood more clearly.

Component C provides a framework from a diachronic perspective for investigating whether culture is an important element explaining decision-making in territorial management process. The diachronic approach for analysis takes continuous changes of development conditions into account (see Section 3.5 for further detail of this component). The framework is adapted based on the Institutional Analysis and Development (IAD) framework. The analysis using this component of the integrative framework engages the complexity of an urban system that combines influences of multiple development conditions, rather than solely culture, in regards to the shaping of decision-making and outcomes in territorial management.

The framework decomposes the understanding of how culture is relevant in territorial management processes in the form of dynamic interrelationships between development conditions for dynamic decision-making processes regarding territorial management. The decomposition approach enables the investigation of influences of other development conditions rather than solely the formal and informal institutions (which significantly influence professional practices). This approach is useful because these other conditions (physical and social attributes) are presumed to have influences on the experiential knowledge of actors, which is likely reflected in people's decision-making processes and actions in territorial management.

As aforementioned, the analysis includes both a comparison between cultural values, planning policy and management outcomes and a comparison of management approaches across territories, actors and periods of time. These sets of comparisons help facilitate the analysis of whether certain sets of conditions are likely to affect the shape of management outcomes. By connecting the information derived from these sets of comparisons, dynamic relationships between spatial-related and cultural-related contexts and management outcomes can be seen and understood more simply and clearly. This is expected to bring theoretical contributions to understanding which factors in relation to culture significantly influence decision-making in territorial management processes and the implications of cultures on the design and implementation of spatial planning policies.

Methods for analysis

The study is based on mixed-methods for analysis that combine the analysis of empirical evidence through observation and interpretive methods. Observation techniques are used for the analysis of, for instance, physical artefacts and data derived from questionnaires (i.e. secondary data from previous studies). Interpretive methods are used for the analysis of relevant symbols and languages that expresses cultures regarding territorial management in relation to flood-related issues (such as religious principles, underlying principles or objectives of rituals/ceremonies and objectives in the relevant management plans). They are also used for analysing data derived from interviews. Employment of mixed-methods and an analysis based on variety of sources

of evidence helps strengthen validity and reliability of the analysis. This is because it enables cross-checking of the consistency between the different sources of evidence; also, weaknesses of one method can be complemented by strengths of other methods and (van de Vijver and Leung 1997). The sources of evidence and the methods for analysis employed in the cross-national and the sub-national comparisons are slightly different. This is mainly because of differences in their purposes of investigation and the ability to access and collect the relevant information.

The analysis at the cross-national level focuses on investigating generalised influences of institutions in relation to flood-related management, which are assumed to be in common throughout the regions. The institutions here refer to both informal institutions, such as norms, core values and belief systems, and formal institutions, such as laws and regulations. Secondary data, both quantitative and qualitative types, that are available at the national level or according to the generalised cultural groups (such as religions) are the main sources of evidence for this level of analysis. This includes data collected at the national level, such as the generalised cultural values in Hofstede (2011) and the World Values Survey (WVS n.d.), and data from other sources and previous studies about cultures in relation to management in general and cultures in relation to territorial and water management regarding flood-related issues in particular. These include, for instance, the archival records and documentations on flooding events and interpretative studies of religions and their influences on social and environmental discourses.

The main advantages of using the cultural values provided in Hofstede (2011) and the WVS (n.d.), are its high degree of reliability and comparability and the wide coverage of the data in many countries. The high degree of reliability is created by the large number of samples that were collected and analysed by experts. In addition, the surveys were based on a common set of questionnaires and consistent methods, which create the high degree of comparability between cultural traits across a wide range of countries. However, using this secondary data also has constraints. The major constraints for this study are (i) its elucidation for the specific values in relation to natural and environment management and (ii) the insufficient up-to-date and randomness of the samples, especially from the surveys of cultural values by Hofstede (2011) that only include IBM employees. This limitation is complemented by the analysis of the other sets of data, either quantitative or qualitative ones, that are more relevant to the scrutinised aspects of analysis. The use of multiple sources of data sets helps justify the validity of the general cultural values taken from previous studies to explain the specific dimensions of culture in regards to floodplain management in this study.

On the other hand, the analysis at the sub-national level focuses on exploring contextualised effects of cultures that are argued in this study as being significantly influenced by local conditions through personal experiences. The analysis mainly uses primary data collected through semi-structured interviews of local residents,

planners and the competent agencies in floodplain management, along with direct observations of physical artefacts (such as water management measures and spatial development patterns). This data is more specific to the issue of research and to the case studies at the local level than the generalised data available at the national level. These data provide possibilities for a more contextualised and in-depth analysis, which would bring about complimentary explanation to the variations of behaviours within the framework of the so-called 'national culture'. Regarding the collection of primary data, participants and objects of observation are selected based on specific criteria for this study rather than to meet statistical requirements. Two fundamental criteria for participant selection are (i) their lived experiences with management of flood-related issues (including residents living in inundated areas and spatial planners involved in preparation of the scrutinised policies) and (ii) sufficient diversity amongst the participants, which helps enhance possibilities of rich and unique stories on the subject. The analysis also uses other sources of secondary data, such as newspapers, books, photographs and video.

3.3 A framework for characterising cultures in territorial management

This section elaborates the framework proposed in this study to characterise culture regarding territorial management (component A). It consists of two main parts. The first part provides an approach for characterising cultures in a form of institutions, which are distinguished by their different influences in decision-making into three levels, which are the constitutional, structural and operational levels. The second part provides an approach for classifying cultural values, planning policies and territorial management outcomes into a comparable form of ideal types using two typologies - the resource management typology and the social organisation typology. Each part is elaborated in the following sub-sections.

3.3.1 Expressions of culture as three levels of institutions

As mentioned in Section 2.2.2, one of the fundamental critiques on the use of Douglas's (1992) cultural theory is that it is necessary to distinguish different levels of cultural expressions in the analysis of culture. This study thus incorporates levels of cultural expressions in the framework for analysis. The distinguished levels are essential for this study because the expressions of culture can be dissimilar at different levels their (dis)integration across levels is argued in Gullestrup (2006) as being one of the factors that significantly determine the possibility of culture changes (see Section 2.2.3 for Gullestrup's theory). These factors are adoped by this study and employed as factors are argued as significantly determining the likelihood of policy acceptance in practice (see Section 3.4 for more details about all the factors).

In this study, it is suggested to distinguish expressions of culture regarding territorial management into three levels, which are the constitutional level, the structural level and the operational level. These three levels are defined not by the level of visibility to observers as suggested in Gullestrup (2006) and Knieling and Othengrafen (2009b), but by the level of influences to decision-making as employed by institutionalist approaches, such as in Ostrom (2005b) and de Jong (1999). This is because it would better serve the purpose of this study, which is to investigate the role of institutions and possible interventions to shape development outcomes. The three levels of institutions are defined as follows:

- Institutions at the constitutional level refers to grounded rules, such as worldviews, norms, belief systems and shared values in territorial management, that provide contexts in which relations take place and decisions are made.
- Institutions at the structural level refers to the structured forms of culture in territorial management, which present in the forms of social structure, administrative systems, legislative structure and organisational relations between the involved actors in the community.
- Institutions at the operational level refers to the whole set of exploratory activities, procedures, tools and techniques used within the constitutional and structural frameworks. This can be observed from the management strategies, measures, instruments and procedures employed to deal with the management problems and the spatial development outcomes.

Here, the three levels of institutions refer to the three main elements in which this study explores their interrelationships, which are cultural values, planning policies and territorial management outcomes. They are called in the integrative conceptual framework as 'informal institutions', 'formal institutions' and 'outcomes' (see Section 3.5). The three elements are compared to see whether the three elements conform to one another and to investigate the influences of their (non-)conformity using the conceptual framework for analysis from a synchronic perspective (component B), as described in Section 3.4.

3.3.2 Ideal types in territorial management

In this study, it is suggested that the comparison of the three levels of institutions is based on the classification of territorial management in the form of ideal types. The classification method in a form of ideal types is relevant to this work because they enable comparisons of the management approaches across territories, actors and periods of time as well as comparisons between cultural values, planning policies and territorial management outcomes. The ideal types are classified using social organisation typology and resource management typology. In the specific context of floodplain management undertaken in this work, each management typology is constituted by two dimensions of culture regarding territorial management. Their constituting dimensions and the ideal types are elaborated below.

Ideal types regarding social organisation aspects in floodplain management

The conceptual framework proposes that cultures regarding social organisation in floodplain management are strongly connected to the 'power distance' and 'social integration' dimensions in management. These dimensions are fundamental for characterising social organisation cultures regarding other aspects of territorial management as well. The relationship of these two dimensions constitutes four ideal types of social organisation, as shown in Figure 11. Development of these four ideal types is influenced essentially by the 'group-grid cultural theory', which was introduced by Douglas (1970) and refined by Thompson *et al.* (1990), with strong influences also from two of the five dimensions of organisational culture proposed by Hofstede and Hofstede (2005).

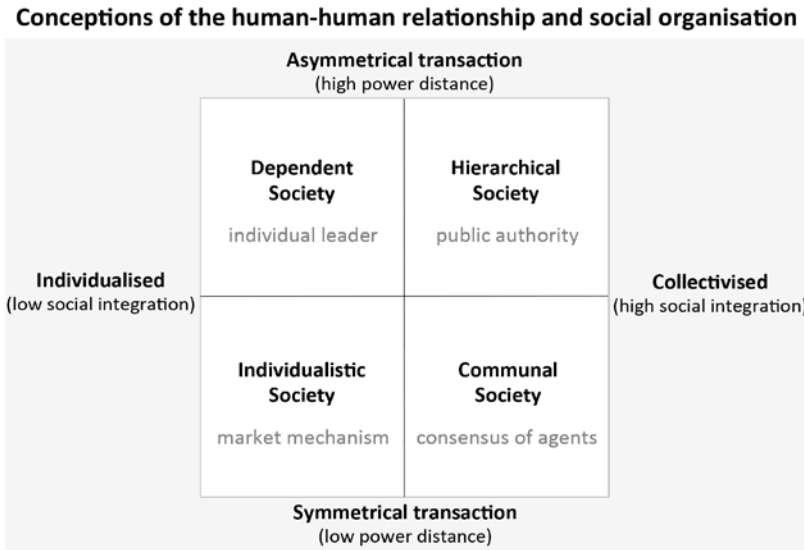

Figure 11
Ideal types regarding social organisation in floodplain management with the associated management mechanisms

The original 'grid' and 'group' dimensions are replaced by the 'power distance' and 'social integration' dimensions respectively. The term 'power distance' dimension is borrowed from Hofstede and Hofstede's (2005) five dimensions of organisational culture. In this study, the term refers to the degree of authority or responsibility in the management of territory that one or more actors have over the others. The 'social integration' dimension is comparable to the dimension of 'individualism-collectivism' in Hofstede and Hofstede's (2005) five dimensions of organisational culture. In this study, 'social integration' refers to the degree of association between actors in a given territory with regards to the management of flood-related issues.

For the 'hierarchical' type, responsibility is given to authoritative organisations composed by experts for management of territory based on collective interests. It is comparable to the 'administrative rationalism', defined by Dryzek (1997, 74), which is rational management in the service of a clearly-defined public interest, informed by the best available expertise. This is slightly different from the 'communal' type of social organisation in which collective interests are also most concerned. Yet, the communal management strategy is based on the concept of egalitarianism, which is achieved through 'democratic pragmatism' processes to get consensus amongst the actors concerned with the problem issue. For the 'individualistic' type, people emphasise their own needs and act according to certain rules rather than to communicate and act collectively with other members. Their management strategy is based on 'economic rationalism' through the use of market mechanisms. For the 'dependent' type,

floodplain management strategies are predominantly identified based on the interests of actors that are associated with privileged conditions or authority over others. These strategies may or may not be conforming to public interests. Yet, people being under or dependent on a privileged actor are supposed to follow these strategies.

Ideal types regarding resource management aspects in floodplain management

Cultures regarding resource management refer to the ways humans interact with natural resources and related environmental challenges (which is called hereafter as 'nature'). Thompson (2000) argued that the way one conceives human-human relationships and behaves in social organisations correlates with how one develops their conceptions and interactions with nature. This is countered by the argument given by this study, namely that the elements underpining these sets of values may vary and should be analysed independently from each other. Based on this assumption, the 'uncertainty avoidance' and 'nature integration' dimensions are employed for the classification of floodplain management into four ideal types of resource management, as shown in Figure 12. Unlike the ideal types regarding social organisation, these dimensions are rather specific for characterising cultures regarding floodplain management than for those regarding territorial management in general. This means that researchers may need to define different dimensions of culture for characterising cultures regarding other aspects of territorial management, such as housing planning.

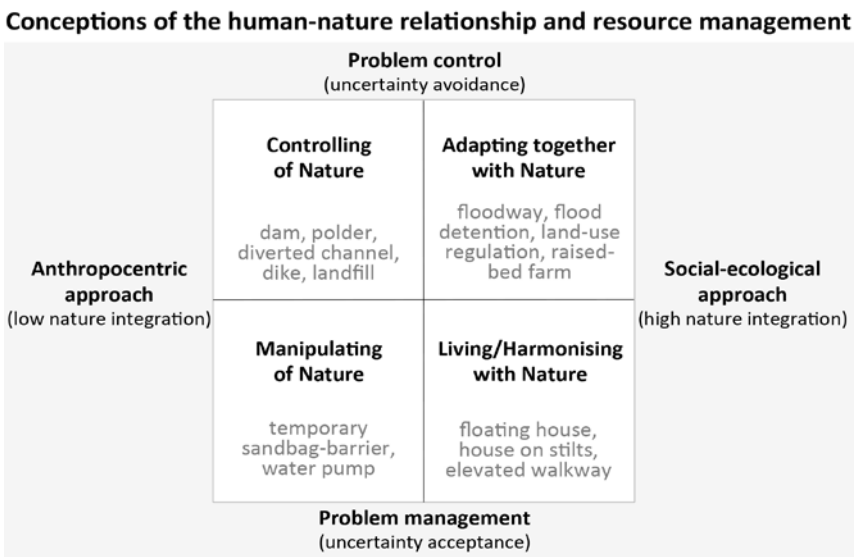

Figure 12
Ideal types regarding resource management in floodplain management with the associated management measures

The 'uncertainty avoidance' dimension, presented as the vertical axis, refers to the degree of (in)tolerance to ambiguity. People or societies that are associated with a high degree of uncertainty avoidance try to avoid floods in their habitat. In contrast, those associated with a low degree of uncertainty avoidance tend to allow floods to take place and then take action to deal with the situation. The 'nature integration' dimension, presented as the horizontal axis, refers to the ways people deal with problems. People who bear an anthropocentric conception (i.e. a low degree of nature integration) would put humans at the centre of management processes by adapting the environment for the benefit of humans. In contrast, people who bear a social-ecological integration conception (i.e. a high degree of nature integration) tend to position humans as part of a bigger system, and therefore tend to adapt the way in which they interact with nature so as to be in harmony with the whole integrated social-ecological system.

The 'controlling of nature' type and the 'manipulating of nature' type of resource management share a common principal idea, which places nature as a resource to be used to improve human's welfare and consider floods as being subordinate to human problem-solving efforts (Thompson 2000). The main distinction between these two types is the different degrees of control over their environment. Yet, the idea of minimising the negative impacts of bold experimentation in the face of uncertainty distinguishes the 'manipulating of nature' type from the 'controlling of nature' type, which put most efforts on preventing inundation in a given area (Dryzek 1997). An example of management approaches corresponding to the 'controlling of nature' type in floodplain management is the construction of dams, dikes, polders and landfills. An example of the 'manipulating of nature' type is the temporary installation of sandbags and water pumps during flooding periods. The central principle of the 'adapting together with nature' type is to configure balanced relationships between nature's limitations and human's needs through learning processes and to adapt their behaviour together with their environment to fit the conditions accordingly. An example of this management type is the adjustment of land use, such as raised-bed farming. The idea of the 'living/harmonising with nature' type is to find a way to nestle harmoniously inside nature without any major interventions. Examples of this are houses on stilts and vegetation that are resilient to floods (such as floating rice breeds), which allows people to live with floods with minimal damage and without efforts to control water.

3.3.3 Methods and parameters for classification of culture

This section explains the methods and parameters used for classifying how floodplain management was conceived, formulated and operated in the case studies. In other words, it presents how to derive the ideal types of management cultures expressed at three levels of institutions in the case studies. The parameters and methods used for extracting and classifying the management approaches into ideal types are different for the analysis at the cross-national level and that at the sub-national level. This is because of the different emphasises of analysis at the two levels, as described earlier in Section 3.2.

The classification of management approaches presented at the constitutional level of institutions (i.e. cultural values) for the cross-national comparison is based on the analysis of several sources of data, including both quantitative and qualitative types of evidence. The quantitative sources of evidence are cultural values derived from previous surveys carried out internationally. They include the surveys carried out by Hofstede (2011) and the WVS (n.d.), in which Schwarzt's (2006) basic human values are integrated. These two sets of data present comparable forms of generalised cultural values at the national level. Thus, they are useful for this analysis in understanding the influences of common norms and values in the shaping of territorial management practice. Table 3 summarises the selected parameters from the two sources above that are used in this study for extracting cultural values (see Annex A-1 for further detail of the parameters).

Dimensions of culture	Parameters
Uncertainty avoidance	UAI: Hofstede's Uncertainty Avoidance Indicator
	A 191: The type of people that avoid anything that might be dangerous (living in secure surroundings is important)
	A 195: The type of people that would like to have an exciting life (Adventure and taking risks are important)
Nature integration	A 197: The type of people that care for nature (looking after the environment is important to this person)
	B 008: The point of view when discussing environment protection and economic growth
	B 002: Agreement to an increase in taxes if the extra money were used to prevent environmental pollution
Power distance	PDI: Hofstede's Power Distance Indicator
	E 114: The opinion about having a strong leader who does not have to bother with parliament and elections as a way of governing the country
	E 115: The opinion about having experts, not government, make decisions according to what they think is best for the country as a way of governing the country
	E 116: The opinion about having the army rule as a way of governing the country
	E 117: The opinion about having a democratic political system as a way of governing the country
	B 003: The agreement to the government to reduce environmental pollution, but it should not cost me any money
Social integration	IDV: Hofstede's Individualism Indicator
	C 039: The agreement to the statement 'work is a duty toward society'
	A 193: The type of people that care for their well-being (it is important to help the people nearby)
	E 036: The point of views towards private ownership versus government ownership of business and industry
	E 037: The point of views towards government's responsibility to ensure that everyone is provided for versus people's responsibility to provide for themselves
	B 002: The agreement to an increase in taxes if the extra money were used to prevent environmental pollution

Table 3
Selected parameters for the quantitative analysis of cultural expression at the constitutional level
Note: The code in front of each parameter refers to the code used in the original data sources, i.e. cultural dimension in Hofstede (2011) and the code of the questions in the WVS (n.d.)

The classification of cultures for the cross-national analysis also takes into account the other sources of evidence that are particularly related to cultures in relation to floodplain management. This includes, for instance, previous studies on culture and water management and the interpretation of cultural traits from languages, ceremonies, rituals and religions in the two regions. This is because they are assumed to have correlation with the cultures employed in a given community to a strong degree. However, what to include varies from case to case according to the available

sources of evidence. The cultural traits presented in these qualitative values are extracted based on narrative analysis. The inclusion of this interpretive evidence serves two purposes. First, it enables the extraction of cultural traits in the past, which the Hofstede's survey and the WVS do not cover. This is to enable the analysis of the dynamics of cultures over time periods. Second, the cultural values from Hofstede (2011) and the WVS (n.d.) are secondary data collected for different purposes from the objectives of this study. They may not truly present cultural values in relation to floodplain management in particular. The classification based on the holistic justification of all this data is, thus, expected to help reduce deviations of the data for explaining cultural values in regards to floodplain management in particular.

For the sub-national comparison, the analysis is based mainly on the semi-structured interviews of people living in the three selected districts for analysis. Semi-structured interviews were used in this study because it is considered a useful way to collect local in-depth information. In other words, the interviews provide more context-specific than the data regarding culture that was available at the national level. In addition, semi-structured interviews also allow researchers to talk with people through questions that deal with a slippery and delicate concept like culture, which questionnaire may not be effectively able to deal with. The derived information is useful for this study to understanding influences of local conditions that may impact individuals' experiences and create variations in culture and outcomes at the local level.

The questions in the interviews are related to the questions used by the WVS but are made more specific to the flood-related management issues. Questions are divided into four parts (see Annex A-2 for detail of the interviews). The analysis of cultures at the constitutional level of institutions is based on the analysis of information gathered by questions mainly in Part 1 and Part 3_B of the interviews. These two parts ask about the values of respondents in relation to the four dimensions of culture and respondents' attitudes towards various policies that correspond to different management types. Cultural values are interpreted according to the degree of agreement to the statements and policies mentioned in the questions.

The classification of management approaches presented at the structural level of institutions (i.e. formal planning) is based on interpretive methods regarding which actor or authority is officially competent in the management of flood-related issues and what are the management types implied by the principal objectives of management, the management measures and the laws and regulation present in the planning documents. For the classification regarding social organisation types, it is to analyse the formal forms of governance structures whether it is a centralised authority or the community or any other entity that is officially competent in management of flood-related issues. The classification regarding resource management types is executed through narrative analysis. It is based on the analysis of competent ministries, departments or others that are officially assigned to environmental and

water management and their focus or underlying principle for the management. These parameters can be observed from organisational structures, legislative structures, management approaches and stated objectives. The results from the interpretation are crosschecked with previous studies (if available) and/or interviews of planners carried out in this study.

The classification of resource management types presented at the operational level of institutions (i.e. planning practices and management outcomes) is based on observations and the interpretation of management measures being employed to manage flood-related issues in the development of a territory and spatial development outcomes in the forms of, for instance, land use and development density. The sources of evidence are spatial maps, statistical data and the other types of available archive records. For the classification of social organisation types, it is based on the analysis of the procedures in the management, such as the participation and roles of each involved actor in the management processes. At the sub-national level, the analysis includes not only the spatial analysis, but also the information from the interviews carried out in the three selected districts for analysis at the sub-national level.

3.4 Factors influencing decision-making in territorial management from a synchronic perspective

This section describes a framework to analyse from a synchronic perspective whether culture is an important element explaining territorial management in the case studies, under an assumed stable state of culture. It refers to component B of the integrative conceptual framework illustrated in Section 3.2. This synchronic framework for analysis is used in Chapter 8 for investigating influences of culture on policy acceptance in practice. The term 'policy acceptance in practice' here is reflected in the form of planning practices and spatial development outcomes that correspond to the policy objectives. The analysis of whether similar types of management policies are accepted in different cultural settings is relevant for this study because it is expected to contribute to a better understanding of what are influences of culture in determining territorial management outcomes.

The synchronic analytical framework helps simplify an analysis of public policy by focusing on the analysis of relationships between planning policy and culture on a specific moment in time only. The framework includes four basic factors that are presumed in this work to significantly determine whether the policy initiative would be accepted in practice by those who are affected by the policy. These four factors are adapted from the factors argued by Gullestrup (2006) as significantly influencing the

probability of culture changes (referring to the term 'policy acceptance' in this study), as described in Section 2.2.3. Figure 13 illustrates the relationships between the four factors and the likeliness of policy acceptance.

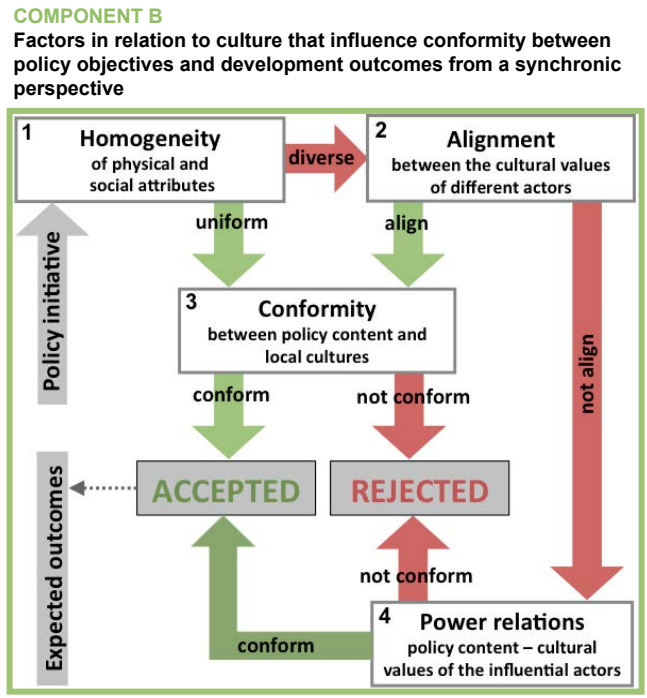

Figure 13
Conceptual framework for analysis of influences of cultures on the determining of the management outcomes from a synchronic perspective

The first factor is the 'degree of homogeneity'. This proposed framework presumes that the homogeneity of physical and social attributes of a territory in relation to the degree of sensitivity to floods is likely to generate uniform culture regarding territorial management. Diverse attributes may generate diverse cultural values amongst actors of which their habitats or activities are associated with different degrees of flood risk. It depends on the 'degree of alignment' between these cultural values whether the community would be considered having uniform or diverse cultures. In the case of the community with a uniform culture, the decisive factor whether a policy will be accepted is the 'degree of conformity' between the management type present in the policy content and the local cultures. The more conforming they are, the higher chance that policy initiatives will be accepted. In the case of a community in which the cultural values of different actors are not aligned, 'internal power relation' is the decisive factor for policy

acceptance. It presumes that the greater conformity between the management approach of the policy and management cultures of the most influential actors in the decision-making processes, a higher chance of policy acceptance can be expected.

In short, the conceptual framework presumes that 'conformity' between the management types of the planning policy and the dominant cultural values in a given community is a key element influencing policy acceptance in practice. The assessment of whether the management types expressed at different levels of institutions are conforming is based on comparisons of ideal types as described earlier in Section 3.3. The analysis regarding homogeneity is based on the physical characteristics of the area and the socio-economic characteristics of the settlements in relation to degree of sensitivity to floods. The parameters include, for instance, the possible degree of damage caused by floods and the share of economic activities categorised by their vulnerability to floods. The classification of cultures is based on data sources that directly inform cultural values and also indirect sources that require interpretation, as described in the previous sub-section. For the assessment of uniformity and alignment of the cultural values, the degree of kurtosis and skewness of the data from the WVS are employed. It assumes that the high percentage of the cultural values with high kurtosis and strong skewness represent a high degree of uniformity and alignment of cultures in the society towards one particular cultural trait.[3]

For the analysis of internal power relations, it should be noted that the most influential actors are not necessarily the actors with the most authority or legitimacy to manage flood-related issues. The identification of the most influential actors for the analysis of resource management-related policies is based on the influence of actors on directing development outcomes. Parameters include the relevant laws and regulations in water management and land ownership (especially, in the context in which formal institutions do not have legitimised authority to direct development). For the analysis of the social organisation-related policies, the most influential actors are identified based on the governance model. This can be derived from the analysis of the literature on power relations in territorial and water management regarding flood-related issues in the case studies in the given periods of development. If that specific information is not available, the analysis of power relations in the political and social model is taken instead.

3 The high percentage of the cultural values refers to the value of more 68 percentage/points or more towards one pole. This is based on the value of 1 SD. The interpretation of the skewness and the kurtosis values is based on the principles of statistics suggested in Bulmer (1979). It is namely that if skewness is less than -1 or greater than +1, the distribution is highly skewed. If skewness is between -1 and -½ or between +½ and +1, the distribution is moderately skewed. If skewness is between -½ and +½, the distribution is approximately symmetric. Regarding the kurtosis value, the neutral value is assigned to 0. This neutral value refers in this study to the moderate degree of variance of the data set. The kurtosis that values over +1 refers to the high degree of consistency of the data set.

3.5 Dynamics of cultures and their influences on decision-making processes from a diachronic perspective

This section describes an approach to analyse influences of cultures in decision-making processes from a diachronic perspective with a relational point of view (this refers to component C of the integrative framework). This perspective of analysis is crucial because culture is subject to change through learning and adaption processes when circumstances change (Friedmann 2005b; Reimer and Blotevogel 2012). These changes would then result in changes in the conditions underpinning decision-making and planning activities. This issue is significant for understanding the influences of culture on territorial management practices.

The fundamental premises of this analytical framework correspond to those of the Institutional Analysis and Development (IAD) framework developed by Ostrom (2005b), which is extensively applied in the field of public policy analysis. The framework decomposes the complex interactions between cultures and other development conditions and their influences on decision-making in territorial management process in the form of simplified relationships between a set of components. This deconstruction is underpinned by the modernist perspective that looks at culture as a variable dependent on the social, economic and technological realities it is situated in.

Generally, the conceptual framework maintains the idea of three fundamental components in a building block as suggested in the IAD framework. The three components are (i) the development conditions (which are called 'exogenous variables' in the IAD framework), (ii) the action arena and (iii) the outcomes. The relationships of these components in decision-making processes are illustrated in Figure 14. The interrelationships between the three components is based on the underlying principle of the framework, namely that '*participants craft rules in order to change the structure of repetitive situations*' (Ostrom 2005b, 832). In other words, when outcomes are evaluated by the involved actors as productive or positive, they may increase their commitment to following the rules that have evolved over time. Institutional adaptation takes place when the outcomes are evaluated as destructive or negative, leading to changes in the rules or structure of situations (an element of the development conditions) used in the action arena.

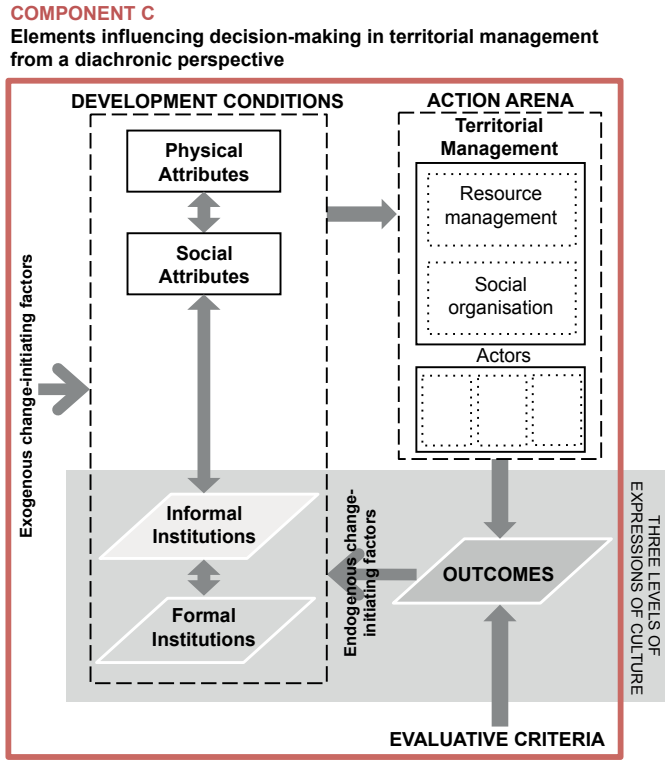

Figure 14
Conceptual framework for analysis of influences of cultures in territorial management process from a diachronic perspective

The above process of evaluation may lead to institutional adaptation through internal processes of change. The internal process of change is triggered by changes of development condition(s) that are not an influence of external factors (referred to here as endogenous-change initiatives). This process may lead to changes in physical and social attributes. The changes in physical and social attributes form new development conditions that may in turn result in institutional adaptation. The conceptual framework elaborated here also suggests that changes in the development conditions may be caused by exogenous factors. These exogenous factors include, for instance, transfers of ideas, technologies, policies and discourses from elsewhere. It can occur through either imposition from external forces or voluntary transfers.

The three exogenous variables presented in the original IAD framework (see Section 3.3.2 for further detail) are re-categorised into four development conditions in the proposed framework here. The re-categorisation is made in order to comply with the main aim of this study, which is to understand how cultures influences territorial management practices. The four re-categorised variables are physical attributes, social attributes, informal institutions and formal institutions. This re-categorisation puts

emphasis on the distinction between possible influences on the shaping of cultural values through personal experiences and those on the taken-for-granted institutions. Beside an attempt to make a distinction between influences of these two parts of culture, the analysis also investigates how these two parts of culture are related. This is because of the fact that *'[i]nstitutional arrangements do, as methodological collectivists contend, constrain individual behavior, but it is also true, as methodological individualists insist, that institutional arrangements are held together and modified by individual action' (Thompson et al. 1990, 21).*

The study emphasises also possible different influences generated by formal and informal institutions. According to these concerns, the 'attributes of the community' in the IAD framework is reframed in this study as social attributes. Cultures (as reflections of attributes of the community) and rules-in-use (which refer to both formal and informal rules) are reclassified as informal and formal institutions. This is to make the analysis of possible influences generated by each element more explicit, especially in the distinction between influences of cultures and planning regulations (i.e. informal and formal institutions respectively).

In the study of the specific issues regarding floodplain management, the term 'physical attributes' refers to flood characteristics in terms of frequency and degree of hazard and characteristics of land and settlements in terms of its vulnerability to floods. The vulnerability to floods is connected to land uses, economic activities, architectural characters and urbanisation density. 'Social attributes' refers to social characteristics of the individual or the community that influence human behaviours in a social system. This includes, for instance, religion, attachment to the land (connected to, for instance, land ownership, occupations and economic activities) and relationships between members in the community. The proposed framework presumes strong interrelationships between these two development conditions and the experiential part of culture. 'Formal institutions' refers to the legitimised forms of norms and rules, including laws and regulations, government's policies and plans and contracts. 'Informal institutions' refer to general accepted values, believes and worldviews. They can be interpreted from the analysis of religious principles, rituals, language (e.g. idioms and meanings given to some words such as flood) and the social and economic models being employed by a society.

This conceptual framework is applied to explain territorial management in the case studies, aiming to identify the major factors underpinning non-conformities between planning policies and management outcomes and those driving changes in the outcomes. Identification of these factors is based primarily on the method of narrative analysis of management outcomes generated by similar types of management policy that were applied in different development settings. This is done through cross-national and sub-national comparisons across different periods of development in the case studies, as elaborated in Chapter 9.

PART II Analysis of Development Conditions and Management Outcomes in the Case Studies

Rationales and framework for the analysis in Part II

4 Physical conditions of the case studies in relation to management of flood-related issues

5 Cultural values in relation to floodplain management of the case studies

6 Formal institutions in relation to floodplain management of the case studies

7 Planning practices and spatial development patterns of the case studies

Rationales and framework for the analysis in Part II

Part II consists of four chapters. Each of them explains development conditions and outcomes in relation to the territorial and water management of flood-related issues in two urbanised delta regions - the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand. Chapter 4 describes background of the case studies and its physical attributes in relation to management of flood-related issues. Chapter 5, Chapter 6 and Chapter 7 analyse cultures expressed in three forms of institutions and how they evolved. The three forms of institutions refer to (i) cultural values, which present constitutional level of institutions, (ii) organisational structures and planning policies and regulations, which present structural level of institutions, and (iii) management instruments and procedures taken to cope with floods and spatial development outcomes, which present operational level of institutions. This is carried out in order to investigate how floodplain management in the two delta regions analysed here was conceived, structured and operated differently. Analysis of the evolution of cultures, planning organisations and their policies and territorial management outcomes is important for this work to gain a better understanding of the relevance and significance of culture in determining planning practice and management outcomes.

The analysis in this part is carried out in a form of comparisons at two levels – a cross-national level and a sub-national level. The cross-national analysis examines and compares whether there are differences in cultural values, planning organisations and policies and territorial management outcomes with regards to floodplain management of the two urbanised delta regions. The sub-national analysis compares these elements in three selected districts in the Chaophraya delta region. The focus of the analysis at the cross-national level is whether the distinctive normative systems of the two regions resulted in different planning practices and spatial development outcomes. Complementarily to that, the analysis at the sub-national level focuses on whether there is a variation of practices and outcomes across the region (at the scale of district), where common normative systems at the national level are assumed. This is necessary to develop an understanding of whether the influences of culture on territorial management outcomes at different levels of development are affected by similar factors.

The characterisation of management types expressed at the three levels of institutions is based on the conceptual framework explained in Section 3.3. The framework suggests using two management typologies to characterise cultures, planning policies and territorial management outcomes. Here, they are called the 'resource

management' typology and 'social organisation' typology. This is because how one conceptualises and behaves in relation to other people (social organisation) may not connect to how they develop their conceptions and interactions with nature (resource management). In other words, the proposed framework presumes that these two management typologies may be influenced by different sets of values. The analysis in this part would thus contribute to validation of this presumption.

Figure 15 shows four ideal types of resource management that are created by combining attitudes to the degree of tolerance to uncertain situations caused by flood risk (uncertainty avoidance dimension) and attitudes to human adaptation of the natural environment to cope with flood risk (nature integration dimension). Figure 16 shows four ideal types of social organisation that are created by combining the degree of social contact in the management of flood-related problems (social integration dimension) and the degree of equality regarding authority between actors involved in management (power distance dimension).

Conceptions of the human-nature relationship and resource management

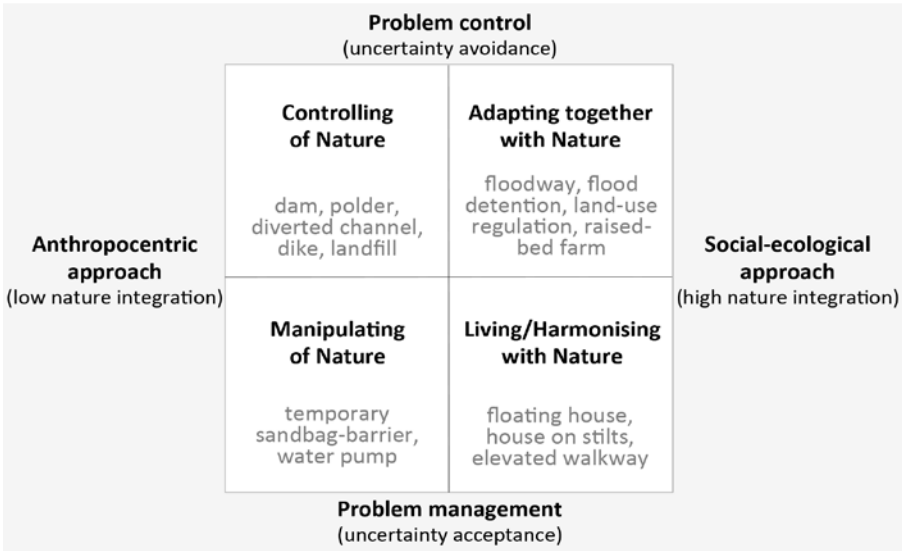

Figure 15
Four ideal types regarding resource management in relation to floodplain management

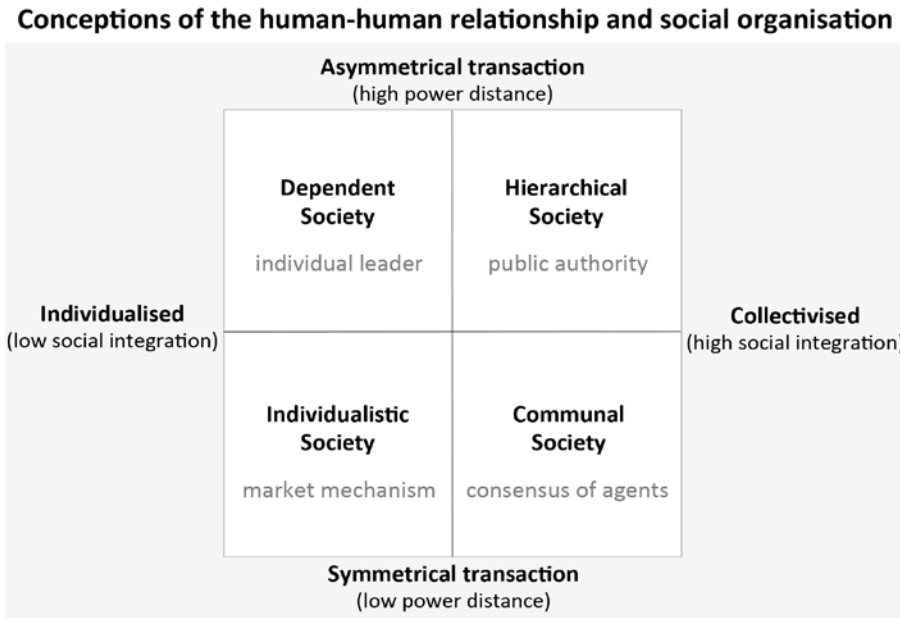

Figure 16
Four ideal types regarding social organisation in relation to floodplain management

The results derived from the analysis and interpretation in this part are the comparable forms of management types present as cultural values, planning policies and territorial management outcomes. These findings are carried out forward into Part III to investigate relationships between cultural values, planning policies and territorial management outcomes. Figure 17 presents the connection of the findings of each chapter with the integrative conceptual framework for the analysis.

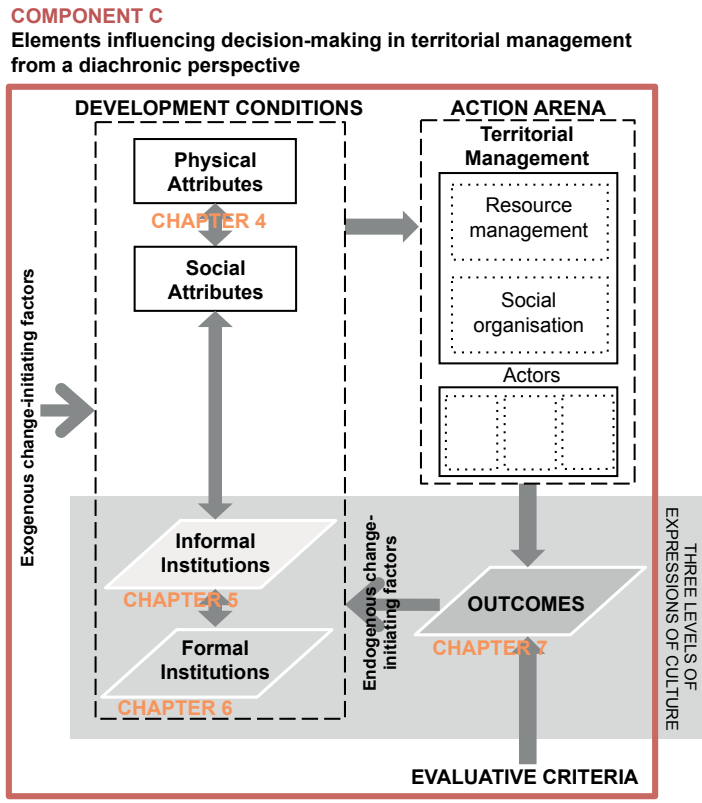

Figure 17
Elements of the analysis in Part II in relation to the overall framework

4 Physical conditions of the case studies in relation to management of flood-related issues

According to the conceptual framework developed in this study, physical attributes are presumed to have strong relations with how floodplain management cultures and practices are shaped. This presumption is supported by Gooderham and Nordhaug (2001, cited in Hofstede 2011), which stated that '*[t]he core differences in values between cultures go back to questions of what works for ensuring survival in relation to the natural environment*. This chapter is part of the investigation of whether that premise is empirically valid. This chapter compares the physical attributes of the case studies. The analysis focuses on comparing natural and man-made environments for development in terms of the degree of flood risk. The findings are then carried forward to Part III to investigate the implications of these similar or different attributes on determining culture, planning policies and territorial management outcomes.

Two delta regions are selected as case studies. The two regions are the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand. These two delta regions are selected as the case studies because they are urbanised and facing common challenges regarding increasing threats created by more extreme floods as a result of changing climatic conditions. In addition, their flood characteristics and land development patterns are different, despite their being physically comparable in terms of size and degree of urbanisation (see Section 1.4 for further detail of the rationales for selection of the case studies). As mentioned earlier, these different physical attributes are presumed to have influences in the shaping of territorial management processes in a given region. This issue is further explored through empirical investigation in the specific context of floodplain management in the subsequent chapters.

The above physical attributes in relation to flooding issues may vary across a region. An example of differences across regions is the case of the Chaophraya delta region. Hence, it is also an interest of this study to investigate whether physical variations at the local scale have effects on determining management culture and management outcomes in relation to floodplain management across a region, where core values and a legislative framework are shared. This issue of territorial scale is important to the development of knowledge in the field of spatial planning that deals with management of territories at different scales/levels. The investigation at the local level is carried out through comparison of three selected districts in the Chaophraya delta region, which have different physical attributes regarding flood characteristics, the degree of flood

sensitivity and risk for development. These districts are called Bangkoknoi-Talingchan, Khlongluang and Bangkhuntien.

4.1 General background of the case studies

The boundaries of the study areas are defined based on watershed areas and administrative boundaries at the provincial and municipal levels. The area referred to as the Rhine-Meuse delta region in this study roughly corresponds to the province of Zuid-Holland and parts of the provinces of Noord-Holland, Utrecht, Noord-Brabant and Gelderland in the Netherlands, as shown in Figure 18. The Chaophraya delta region refers to the lower part of the Chaophraya River Basin in the central region of Thailand. It covers the equivalent territory of the Bangkok Metropolitan Region (BMR), which consists of six provinces as illustrated in Figure 19. The figure also shows the three districts for analysis at the sub-national level. The three districts are named (i) Bangkoknoi-Talingchan, of which two districts are combined, (ii) Bangkhuntien and (iii) Khlongluang, of which three municipal areas are combined.[4] They are defined in accordance with administrative boundaries.

In general, the two delta regions are comparable in terms of size. Yet, the population density of the Chaophraya delta region is almost double of that of the Rhine-Meuse delta region. They are also rather distinctive regarding the causes, the frequency and the extent of floods they face. These aspects are summarised in Table 4. In regards to the selected three districts of the Chaophraya delta region, they are significantly distinctive regarding geographical and flood characteristics as well as land development patterns. These features of the case studies are elaborated in the following sections.

4 The term 'district' in this study refers to the term '*khet*' for the districts in Bangkok and to the term '*amphoe*' in the areas outside Bangkok. The three municipalities combined as Khlongluang are (i) Tha-Khlong Municipality, (ii) Khlongluang Municipality and (iii) These municipalities are three amongst the seven local administrative units of Amphoe Khlongluang.

Figure 18
The area for analysis of the Rhine-Meuse delta region in this study
Sources: Reproduced based on ArcGIS online database (ESRI n.d.) and the Publieke Dienstverlening op de Kaart (PDOK 2013)

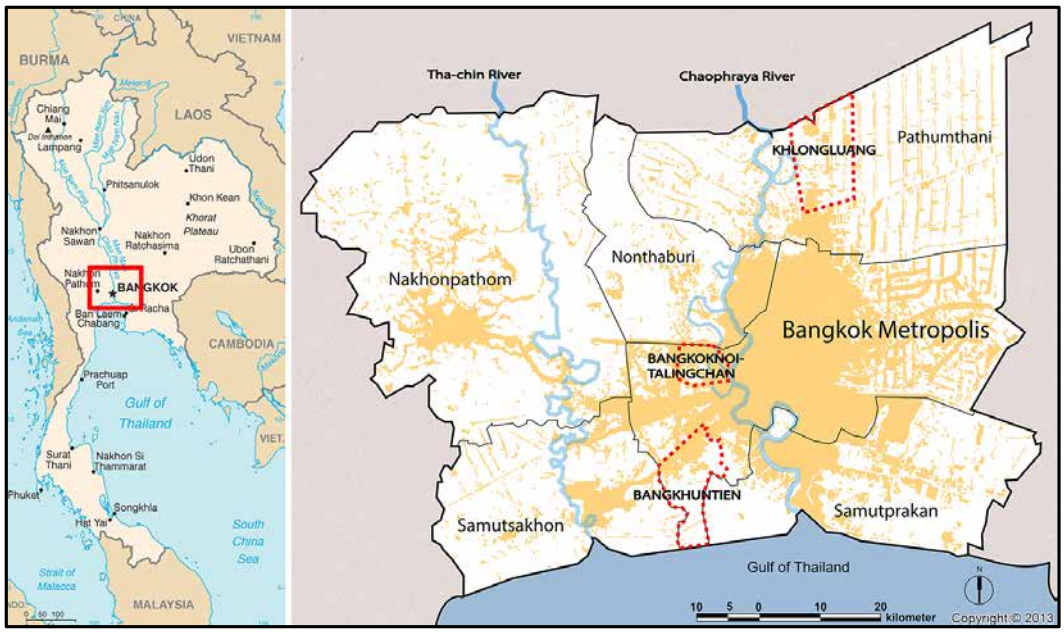

Figure 19
The area for analysis of the Chaophraya delta region in this study and the three selected districts
Sources: Reproduced based on ArcGIS online database (ESRI n.d.) and maps prepared by Department of Public Works and Town & Country Planning (DPT 2008)

Parameters	Rhine-Meuse delta region	Chaophraya delta region
Area (sq.km.)[1)]	approx. 7,500	7,761
Population (million)[2)]	approx.6.5	approx. 15
Average density (inh/ha)	approx. 8.6	approx. 19.3
Mean annual rainfall (mm)[3)]	800	1,500 (35-90 mm/hr)
River discharge (m^3/sec)[4)]	2,500-16,000	1,000-8,000
Major causes of flood	storm surge, river overflow	river overflow, local intense rainfall, floods caused by tidal effects
Flood characteristics	uncertain, low frequency, high damage (possible casualties)	certain, high frequency, low damage (low or non-casualities)

Table 4
Comparison of basic data of the two case studies
Sources:
1) Delta Alliance ("Rhine-Meuse Delta" n.d.) for the Rhine and Meuse delta region and Department of Public Works and Town & Country Planning (DPT 2008) for the Chaophraya delta region
2) Delta Alliance ("Rhine-Meuse Delta" n.d.) for the Rhine and Meuse delta region and National Statistical Office (NSO 2010) for the Chaophraya delta region
3) Buishand et al. (2010) for the Rhine and Meuse delta region and Department of Drainage and Sewerage (DDS 2011) for the Chaophraya delta region
4) Berendsen (2005) for the Rhine and Meuse delta region and Tachikawa et al. (2004) and DDS (2011) for the Chaophraya delta region

4.2 Geography and land uses in relation to flood sensitivity and risk for urban development

4.2.1 The Rhine-Meuse delta region

The Rhine-Meuse delta region is one of the most densely populated areas in the world, with 6.5 million people living in areas of which most are protected by flood defences ("Rhine-Meuse Delta" n.d.; de Moel *et al.* 2011). The geology of the region is shaped by the interference of water streams from the Rhine and Meuse Rivers and currents from the North Sea (van Schoubroeck 2010). The Rhine flows from the northern Alps through western Germany and the Netherlands. The Meuse flows from France through Belgium and the south of the Netherlands. The interference of the water streams has formed long-shaped stretches of sandy banks along the rivers and at the coast. These comparatively higher grounds, both natural and artificial ones, were the areas where early settlements began to take shape in the region and formed the historical centres of present-day towns and cities (van Schoubroeck 2010; Stive and Vrijling 2010). Currently, most of the region is below mean sea level, with the lowest point of more than 6 metres below mean sea level (Hendriks and Buntsma 2009; "Rhine-Meuse Delta" n.d.).

Land development in this region has been significantly based on attempts to fight against nature. Reclamation of peat areas became apparent since the eighth century, followed by the construction of dikes and dams in rivers that began in the eleventh century (Hooimeijer *et al.* 2005; Borger 1998). The reclamation and drainage of peat lands resulted in substantial land subsidence for approximately 1 metre in a century. During the High Middle Ages (1000 AD – 1300 AD), many of these reclaimed peat lands were drowned and had reached the mean water level of the North Sea as well as the ground water level by a few centuries afterwards (Borger 1998; van Dam 2001). As a result, construction of dike systems became necessary for stopping loss of land and for flood protection. By the thirteenth century, dike rings were constructed in most of the flood-threatened areas (Stive and Vrijling 2010). Settlement concentrated in these polder areas. Outskirt developments in areas with peat (or heavy clay) soils have taken place only after World War II (van Schoubroeck 2010). Presently, almost the whole area of the Rhine-Meuse delta region is protected by dike rings, with different levels of protection by law. Figure 20 shows elevation and population density of the delta region (i.e. the Netherlands in this case). This low-lying delta houses a high portion of the economic activities for various commercial uses, industrial uses and business services in the Netherlands ("Rhine-Meuse Delta" n.d.). This is shown in Figure 21. Residential and agricultural land developments are also concentrated in this area. Increases in

urbanisation within the region was observed, as investments have continued to take place in the region (CBS 2009).

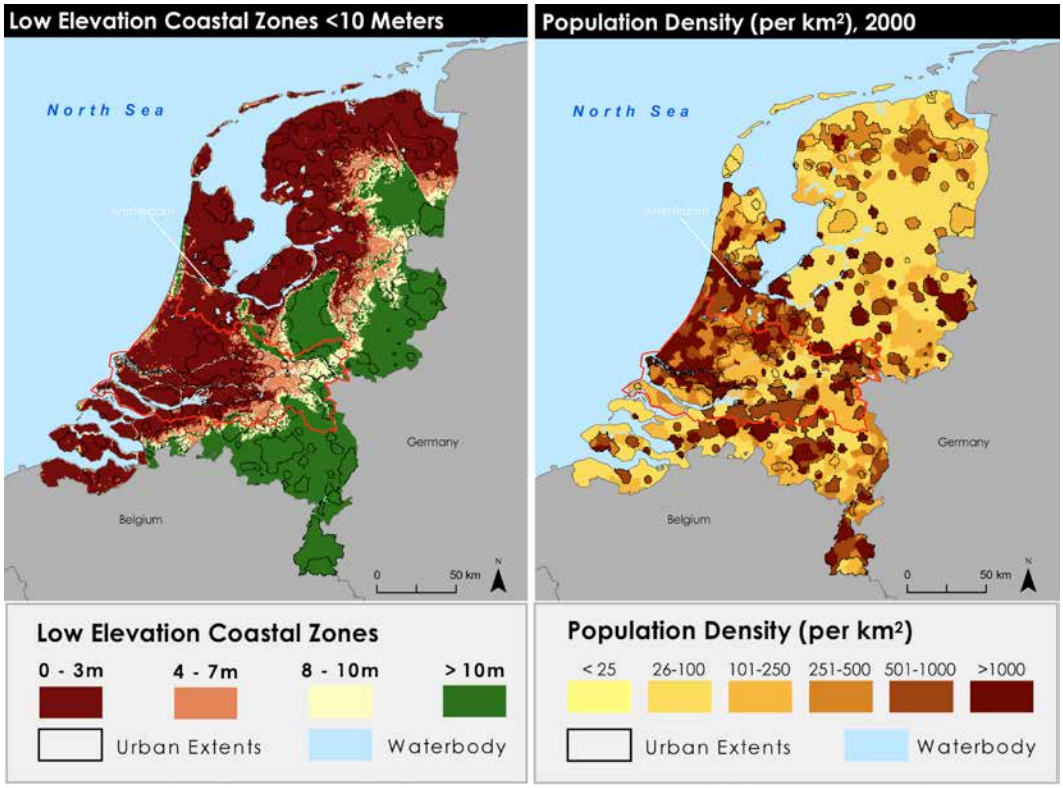

Figure 20
Elevation and population density of the Rhine-Meuse delta region in 2000
Source: Adapted from SEDAC (2012)

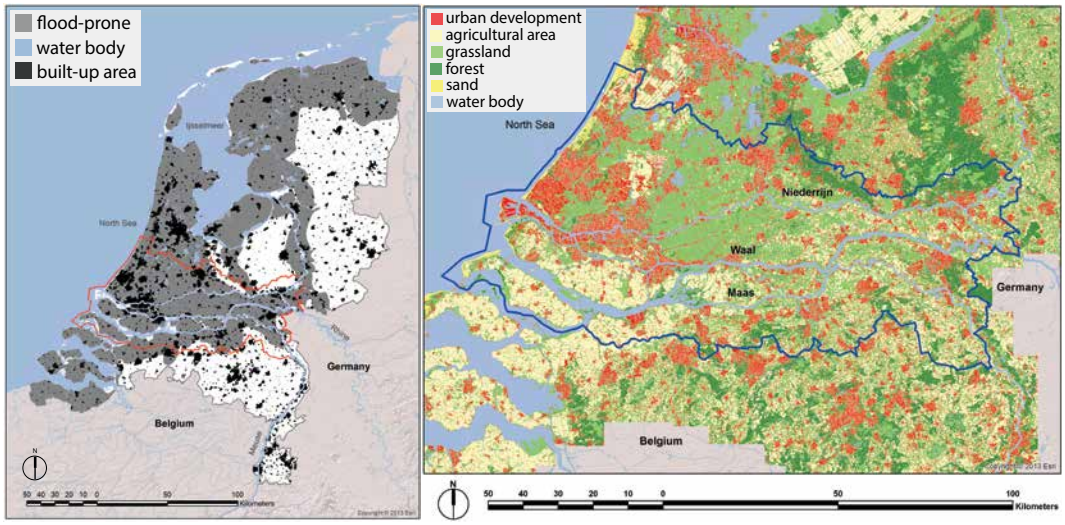

Figure 21
Land development and flood protection areas in the Netherlands in 2010
Sources: Reproduced based on ArcGIS online database (ESRI n.d.) and the Publieke Dienstverlening op de Kaart (PDOK 2013)

4.2.2 The Chaophraya delta region

The Chaophraya delta region is a highly populated delta region, in which approximately 15 million people live and work (NSO 2010). It is part of the Chao Phraya River Basin, which is Thailand's largest rice production and urbanised area with crucial economic importance. The surface of this lowland ranges from flat to slightly undulating, with elevations of about 0.5-1.5 metres above mean sea level in most of the area and groundwater tables near the surface (Jarupongsakul and Kaida 2000). The mean slope is less than 4 metres per 100 kilometres (Jarupongsakul and Kaida 2000). There are two main rivers – the Chaophraya River and the Ta-chin River - running through the region. These rivers collect water from the north of the country. Four main rivers and many small tributaries in the north join and form the Chaophraya River in the central region. The Ta-Chin River is a branch of the Chaophraya River. These rivers run southwards to the Gulf of Thailand. The rivers and its tributaries cause annual floods in the central region. These floods bring in alluvial soil and increase fertility in the low-lying floodplain (Wallipodom 2000).

Early settlement took place on this floodplain primarily due to its soil fertility, which was advantageous for cultivation. Settlements were concentrated on higher grounds, such as on the west of the Chaophraya River and on natural levees along the rivers and canals (Wallipodom 2000). Rapid urbanisation began in Bangkok in the 1950s

(Askew 2002). Since the 1980s, urban areas also expanded to the neighbouring provinces of Bangkok, caused by an influx of immigrants, both from rural areas and outside the kingdom, drawn by economic development in Bangkok (Nathalang 2000). At present, these urban areas have been integrated and become a single extended region (Ouyyanont 2000). Most of these new urban areas are located in lowlands that are highly exposed to flood, mainly on the east of the Chaophraya River (Jarupongsakul and Kaida 2000). Figure 22 shows the elevation and population density of the region. Despite the vast extension of urban areas into the neighbouring provinces, main economic activities are concentrated primarily in Bangkok. These include commercial, industrial and business services activities (DPT 2006).

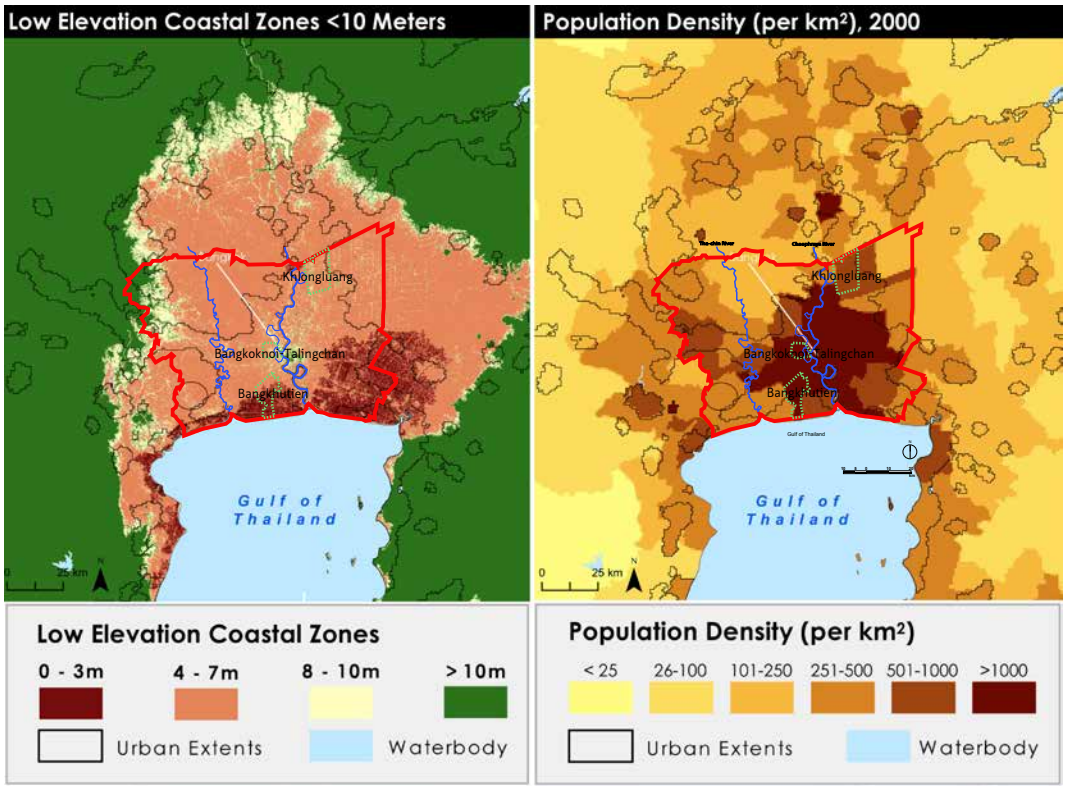

Figure 22
Elevation and population density of the Chaophraya delta region in 2000
Source: Adapted from SEDAC (2012)

4.2.3 Three selected districts in the Chaophraya delta region

The geography of the Chaophraya delta region in relation to the degree of flood exposure is rather diverse across the region. The elevation of the eastern part of the region is generally lower than that of the western part and is more exposed to floods (SEDAC 2012; DWR 2010). Bangkoknoi-Talingchan is a district located in the western part of the region, associated with least exposure to flooding amongst the three districts selected for analysis. Early settlements in the region were also built here (Wallipodom 2000; Molle 2005).[5] Khlongluang is located on a natural floodway of the region. It was left unattended until the turn of the twentieth century, as it was a swampy lowland that was suitable for neither cultivation nor settlements (Srisawalak-Nabangchang and Wonghanchao 2000). Urbanisation in this district became evident only around the last decade of the twentieth century (Hung and Yasuoka 2000). Bangkhuntien is a district at the coast, which lies between the two main rivers. It was observed that early settlements took place here mainly for sea and salt water-related activities. Urban development began only a few decades ago, as a result of extension of roads and highways into the area (DPT 2006; DOL 2009).

Figure 23, Figure 24 and Figure 25 illustrate recent land developments in the three districts. Land development of Bangkoknoi-Talingchan in the part near the core urban area of Bangkok (on the east) is already urbanised. The west part is, however, developed with low-density areas mainly for residential uses on small plots. This low-density development also applies to new housing estates. Low-density here refers to development patterns in which settlements are interwoven with canal networks and agricultural lands, mainly for small raised-bed orchards.[6] These development patterns means that buildings are not concentrated in particular areas, but rather are dispersed throughout the region (see Figure 26).

In contrast, land development in Khlongluang is dominated by large-scale development projects, including manufacturing industries, housing estates and public institutions. Residential areas are more concentrated with much higher densities within developed territories than those in Bangkoknoi-Talingchan (see Figure 27).

5 There are two more supporting pieces of evidence that early settlement took place in Bangkoknoi-Talingchan. First, using the word '*bang*' to call a place represents a way of naming areas associated with dense settlement in the past. Second, organic development patterns based on small-holdings is a characteristic of settlements that typically took place before the new title deeds system replaced the traditional 'occupancy-by-use' land tenure system (Molle 2005). These rationales apply also to the explanation of early settlements in Bangkhuntien.

6 This definition of density is part of the explanation why population density in Khlongluang as shown on the map in Figure 22 appears lower than that in the other two districts. It can also be because land development and urbanisation processes have been apparent only at the turn of the twenty-first century, but the map presents the situation in 2000. Despite being out-dated, this map is used because more updated data regarding population at the district level (i.e. from census) is not available.

This pattern causes an absence of the traditional spatial patterns of the region in which agricultural lands are interwoven with canal networks and settlements in Khlongluang. Rice farming is the main agricultural activity practised here. Land reclamation in this area at the turn of the nineteenth century was primarily initiated to accommodate an increase in demand for export-oriented rice farming (Molle 2005; Jarupongsakul and Kaida 2000; Peleggi 2007).

For Bangkhuntien, settlements are concentrated mainly in the areas associated with a lower degree of flood exposure compared to the rest of the district. Similar to development in Bangkoknoi-Talingchan, land has been developed on small plots (see Figure 28). The part of the district near the core urban area of Bangkok (on the north-east) is already urbanised. In addition, small residential areas adjacent to small to medium-size agricultural lands were rather common. Yet, most of these agricultural lands have been either converted for industrial uses or left unattended. In addition, the development of housing estates has recently expanded into areas with high flood exposure. This was triggered by nearby land development invested by the public sector (e.g. a university) in the adjacent district.

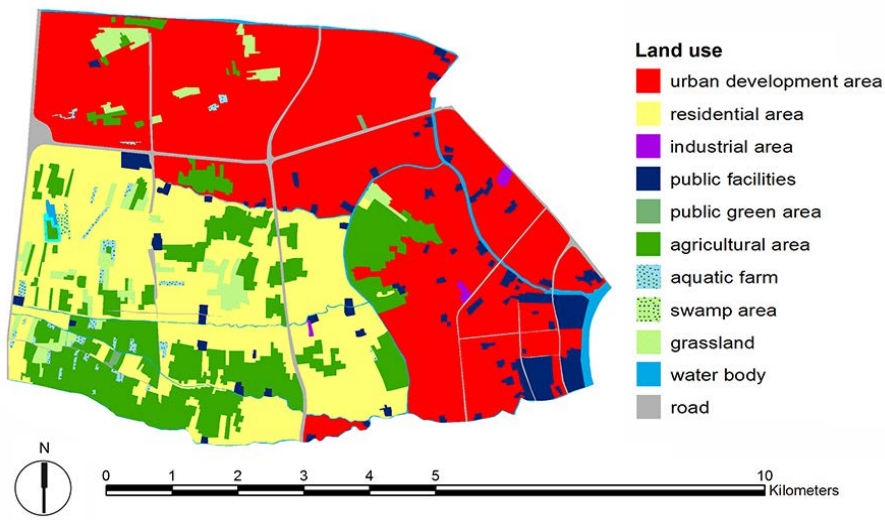

Figure 23
Land development in Bangkoknoi-Talingchan in 2009
Source: Department of Land Development (DOL 2009)

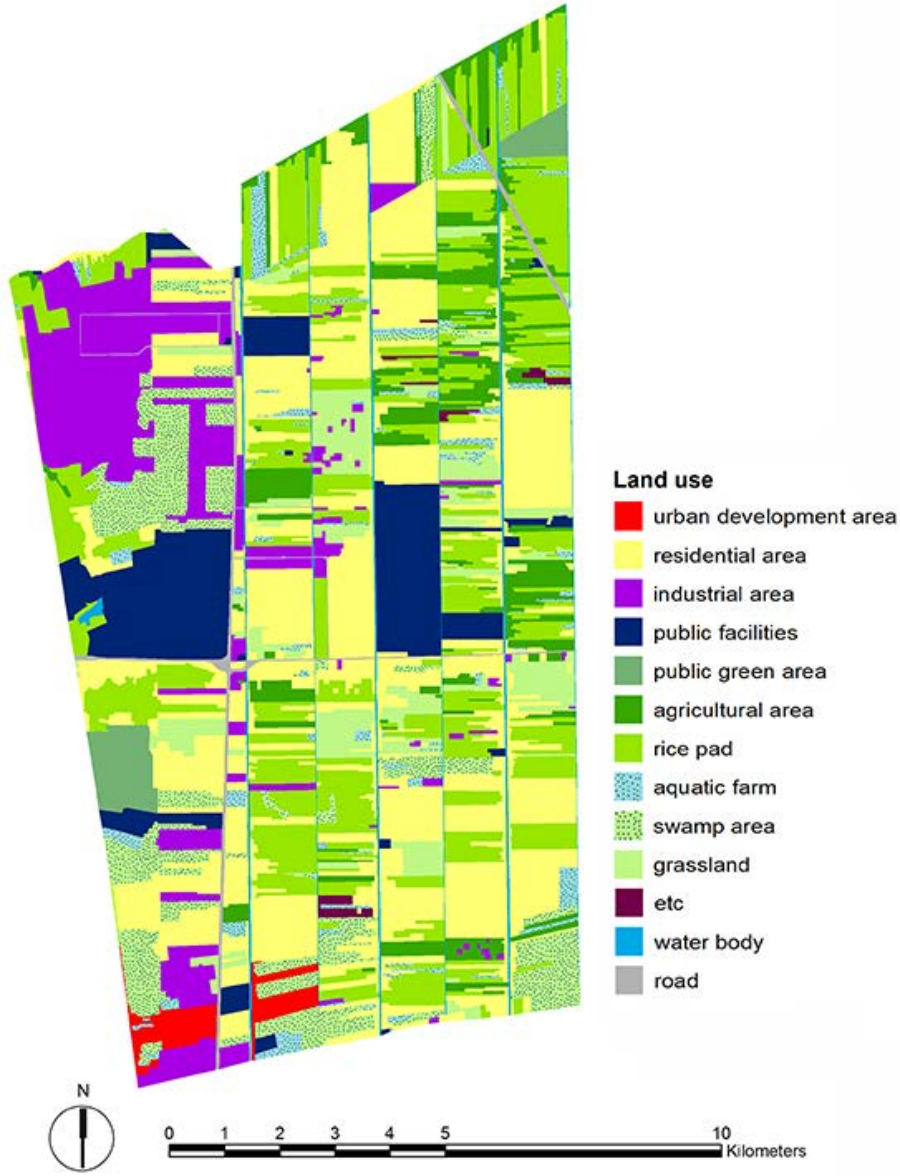

Figure 24
Land development Khlongluang in 2009
Source: Department of Land Development (DOL 2009)

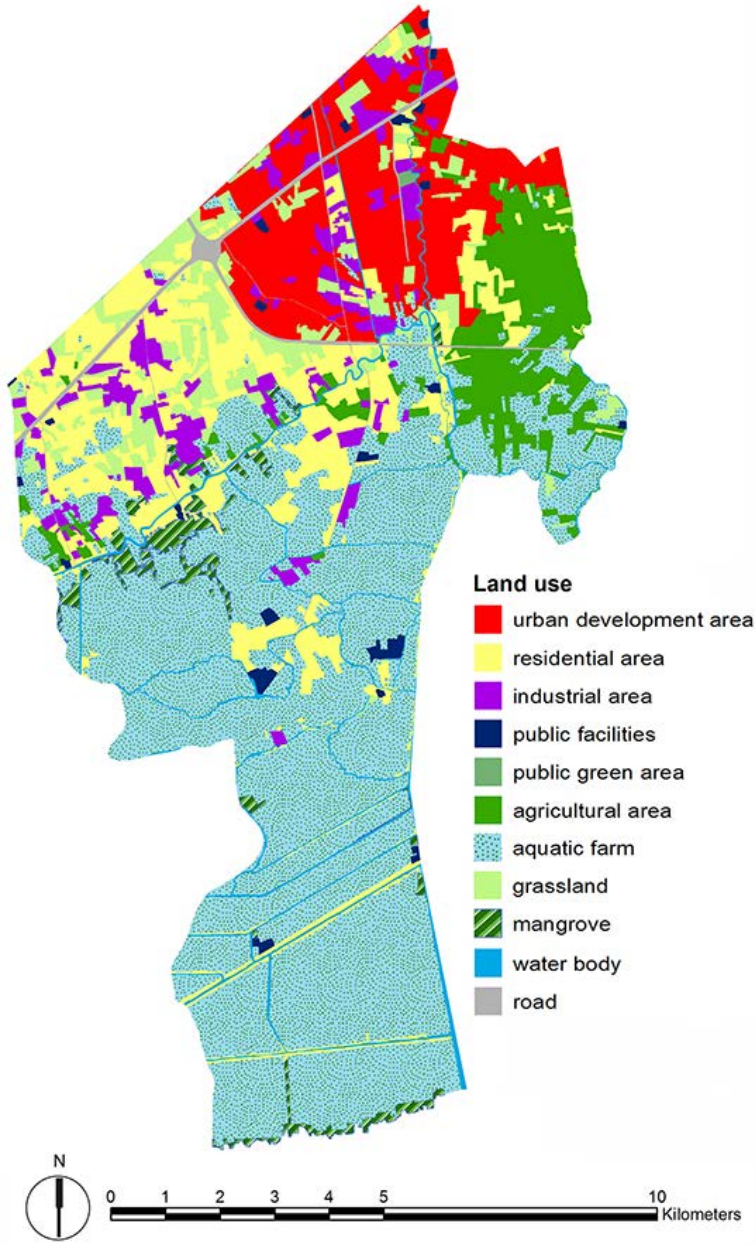

Figure 25
Land development in Bangkhuntien in 2009
Source: Department of Land Development (DOL 2009)

Figure 26
Spatial development patterns in Bangkoknoi-Talingchan in 2013
Source: Aerial photo provided by Google Maps (accessed on 16 October 2013)

Figure 27
Spatial development patterns in Khlongluang in 2013
Source: Aerial photo provided by Google Maps (accessed on 16 October 2013)

Figure 28
Spatial development patterns in Bangkhuntien in 2013
Source: Aerial photo provided by Google Maps (accessed on 16 October 2013)

4.3 Flood characteristics and recent flooding in the past

4.3.1 The Rhine-Meuse delta region

Flooding in the Rhine-Meuse delta region is typically characterised by uncertain, low frequency rates but with very high levels of damage (Bockarjova *et al.* 2009). High damage here refers to both economic losses and possible casualties. The main causes of flooding in the region are storm surges from the North Sea and river overflow. Different measures with technological advances in water control have been carried out over the centuries to protect the region from these floods, especially since the sixteenth century. The employment of technologically advanced water management measures significantly decreased the effects of floods in urban areas in the region. A high proportion of total economic activities and major investments in the Netherlands are currently concentrated there.

However, there have been several events in recent history that have affected the way with which flooding in the Netherlands is dealt. One of these events was the flooding of the province of Zeeland in January 1953 (Hendriks and Buntsma 2009). A combination of a high tide and strong windstorm over the North Sea caused a strong storm surge that exceeded sea defences and caused extensive flooding in the region. This flooding is claimed to have affected around 165,000 hectares of land and to kill 1,835 persons (Stive and Vrijling 2010, 34). This disastrous flood led to the construction of mega-projects known as the 'Delta Works' in the following decades. The Delta Works provide flood protection for the Dutch delta with different levels of protection mandated by law. These levels range from the return period of 1/1250 for the areas along the Rhine and the Meuse Rivers up to 1/10,000 for densely populated areas at the coast, as shown in Figure 29 (Meyer *et al.* 2010).

Since the construction of Delta Works, the region has not experienced any flood disasters. The very high level of protection means that flood damage may occur only under extreme events. Flooding from storm surge is currently not likely and flooding from river overflow may occur only if river run-off rate is greater than 15,000 m^3/sec ("Making Room for Safety" 2011). However, there were two major events that almost resulted in enormous flood damages in the region. They were the extremely high river discharges in the main rivers in 1993 and 1995. The government estimated a critically high risk for dike breaking and asked people to evacuate under a state of emergency (Bezuyen *et al.* 1998). Although floods did not occur in the end, these events partly influenced the new vision of the Dutch water policies towards 'working together with water'. This new vision is elaborated in Chapter 6.

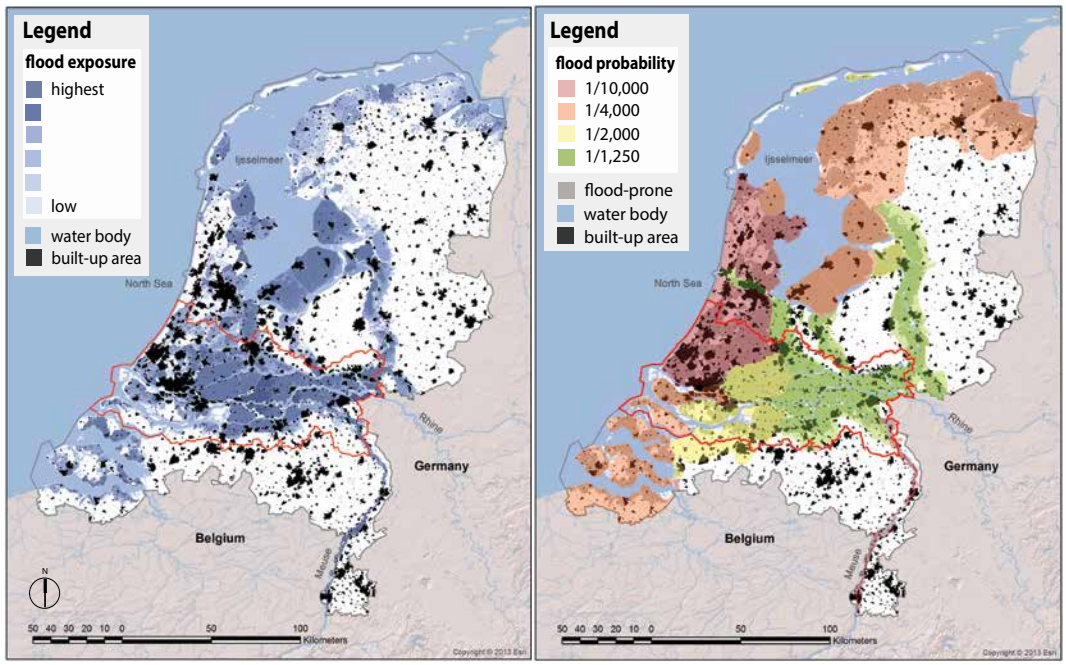

Figure 29
Flood exposure and protection of the Rhine-Meuse delta region
Sources: Reproduced based on ArcGIS online database (ESRI n.d.) and the Publieke Dienstverlening op de Kaart (PDOK 2013)

4.3.2 The Chaophraya delta region

Figure 30 shows areas expose to flood and the current flood protection of the Chaophraya delta region. Excessive water from upstream is a primary cause of flooding in the Chaophraya delta region, which occurs annually in most parts of the region (Hungspreug *et al.* 2000; Vitoonpanyakij 2007). This cause of flooding includes flood caused by water that spills over from rivers and inland excessive surface runoff. Fertility created by alluvial soils that come with annual floods is a significant factor underpinning the spatial and economic organisation of the area. Without any intervention, this type of flood would cause 0.5-2 metres depth of inundation in the region for approximately 2 to 4 months (Hungspreug *et al.* 2000).

Parts of the region also experiences inundation caused by locally intense rainfall and tidal effects, which usually lasts for only a few hours and occurs often throughout the year (Hungspreug *et al.* 2000; Vitoonpanyakij 2007). Locally intense rainfall generally causes around 30-50 centimetres of water depth in the areas with elevations that are relatively lower than their surroundings. Areas influenced by tides stretches between

23-57 kilometres from the mouth of the river (Hungspreug *et al.* 2000). Tidal effects cause not only inundation in the coastal areas, but also prolong the period of annual flooding, caused by excessive water from upstream, in the whole region (Hungspreug *et al.* 2000). This is because high tides reduce the drainage capacity of excessive water from the rivers to the sea. Generally, river overflow is likely when river discharge exceeds 3,500 m^3/sec (Vitoonpanyakij 2007).

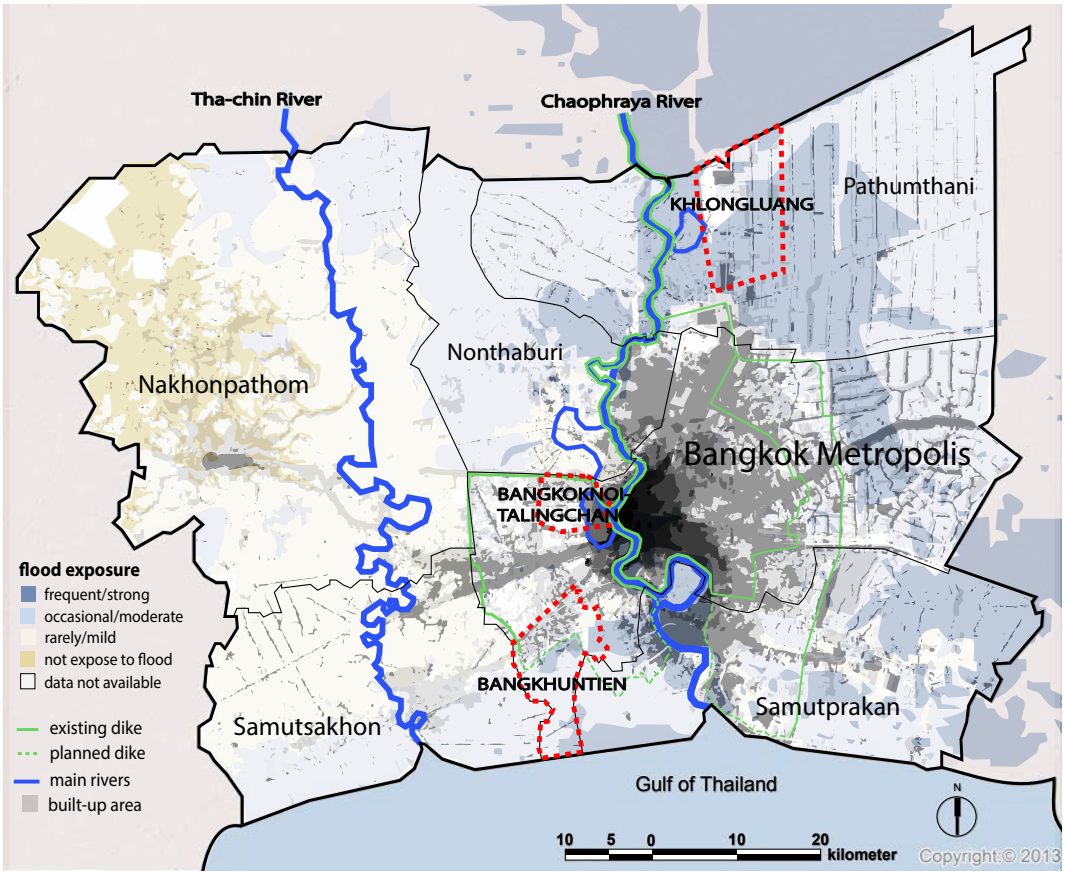

Figure 30
Flood exposure and protection of the Chaophraya delta region
Sources: Analysis is based on information provided by the Department of Land Development (LDD 2000), the Department of Water Resources (DWR 2010), the Department of Drainage and Sewerage (DDS 2011) and the Department of Public Works and Town & Country Planning (DPT 2008). Base map is based on a ArcGIS online database (ESRI n.d.).

Compared with flood characteristics of the Rhine-Meuse delta region, flooding in the Chaophraya delta region occurs much more frequently and more certainly with lower levels of damage regarding possible casualties. This is because water levels (inundation caused by excessive water from upstream) naturally increase slowly, i.e. several centimetres per day over a period of 3 to 4 weeks until it reaches its peak (Hungspreug *et al*. 2000). Thus, people usually have enough time to take countermeasures. Although many measures and efforts have been put in to prevent the region from flooding, flooding events in the region still occur.

The most recent memorable flooding events in the region are the floods of 1942, 1983, 1995 and 2011, which occurred to a greater extent with a greater scale of affected areas. After the floods of 1942 and 1983, various flood prevention infrastructures were built. These infrastructures included dams, dikes and embankments along the main rivers. After that, flooding events did not directly affect the business core areas of Bangkok. Yet, they still caused extensive, long and serious inundation in several peri-urban and rural areas within the region (DWR 2010; BMA n.d.). The flood of 2011 was one of the most catastrophic events in recent history. In this flooding event, people did not have time to adapt to slowly increasing water levels as usual. Many flood barriers collapsed and caused flash floods that resulted in extensive damage to urbanised areas in the region (Verwey 2012; "Battle for Bangkok " 2011; "Worst Flooding in Decades" 2011).

4.3.3 Three selected districts in the Chaophraya delta region

The main causes of floods in the three districts are different. According to the interviews with competent authorities for water management and with local residents, Bangkoknoi-Talingchan has experienced only occasional floods that are caused mainly by overbank flows. This occasional flooding may occur in years of extremely large amount of upstream water that arrived in Bangkok at a very high tide period, such as flooding events in 1995 and 2011. Locally intense rainfall did not cause floods there often. This is because of its higher ground relative to adjacent areas, along with its high share of permeable surface and water bodies in the district as described earlier in Section 4.2.3. On the other hand, Khlongluang is exposed to flooding caused both by excessive water from upstream and locally intense rainfall. This is because this area is a natural floodway of the region, located on relatively lower ground than its surroundings. For Bangkhuntien, large parts of the district are affected by tides, which result in a frequent but low degree of inundation caused by tides in those areas throughout the year. High tides may also result in occasional inundation caused by locally intense rainfall and water from upstream in the district, as it reduces drainage capacity.

4.4 Summary: comparison of physical conditions of the case studies

In summary, the two delta regions are comparable in terms of size, with a higher population density in the Chaophraya delta region. Their flood characteristics are rather distinctive. The physical attributes in relation to flood risk and sensitivity for urban development in the Rhine-Meuse delta region is more uniform than those in the Chaophraya delta region. The analysis in this chapter shows that the geographical and flood characteristics as well as land development patterns of the selected three districts in the Chaophraya delta region are rather distinctive.

Based on the conceptual framework proposed in this work, these differences amongst the two regions and the three districts are likely to have influences on how floodplain management in delta regions has been conceived, planned and operated. This presumption is explored further in the next chapters, focusing on the investigation of interrelationships between physical attributes, cultures, planning policies and territorial management outcomes. The investigation aims at understanding the relevance of physical attributes on territorial management processes, which is crucial for the improvement of spatial planning practice.

5 Cultural values in relation to floodplain management of the case studies

The case studies analysed in this study are presumed to be associated with different people's world views regarding environmental management. In the Netherlands, development approaches that see humans as the centre of a system which is separated from the nature seem to be predominant. This is rather different from the predominant approaches for environmental management in Thailand that consider humans as being integrated with nature as a single system with which they shall be harmonised. These cultural differences that are presented here, based on the proposed conceptual framework developed in this work, are arugued to have significant influences on floodplain management practices and spatial development outcomes.

This chapter employs the conceptual framework developed in this study to analyse and interpret floodplain management cultures in the two selected delta regions examined here – the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand. It aims to uncover the similarities and differences of cultures in relation to floodplain management in the case studies. 'Cultures' here refer to the constitutional level of institutions, which is called in the conceptual framework developed here as 'informal institutions'. They include world views, norms, belief systems and shared values. The cultures are classified and compared in the form of ideal types in relation to resource management aspects and social organisation aspects in floodplain management, as described in the rationales and framework of the analysis in Part II (see Section 3.3.2 for the conceptual framework in detail). The management cultures interpreted in this chapter are then used in Part III to explain whether cultures have significant influences on planning practices and the shaping of the outcomes regarding floodplain management.

The analysis is carried out at two levels - the cross-national and the sub-national levels. The cross-national analysis examines whether cultures regarding floodplain management in the two delta regions, by which distinctive fundamental world views and normative systems are assumed, are different. The sub-national analysis investigates whether there is a variation of cultures across territory within the region, by which shared institutional frameworks are assumed. The examination of cultural traits at two levels is helpful for developing better understandings of elements that significantly influence cultural values and their influences on decision-making processes, as carried out in Part III.

The analysis here is based on the hermeneutic interpretive approach. It uses both qualitative data and quantitative data derived from relevant cultural studies and

surveys. The data used for the cross-national comparison is based primarily on secondary data available at the national level, as the availability and accessibility of data at the regional level is rather limited. Information derived from the semi-structured interviews with the inhabitants who live in the three selected districts in the Chaophraya delta region carried out in this study is used as the primary source of evidence for the analysis at the sub-national level.

Religions are taken as one of the main parameters for interpreting cultures in this work for both case studies. In addition to that, languages, ceremonies and rituals are also used as the parameters, especially for the case of the Chaophraya delta region in Thailand. This is by taking an opportunity of having the author as a native from Thailand. This provides a more in-depth analysis of the Thai case than the Dutch case in this work, as stated in the limitations of the study in Chapter 1. These elements are used as parameters for interpreting cultures because they represent the underlying normative values that have underpinned decision-making in the past. In other words, they are likely strongly correlated with the cultures employed in a given community, without defining which parameters are dependent on the other ones.

The analysis also includes the exploration of whether these normative values present in religions, languages, ceremonies and rituals have been embedded as culture in the present time. This is done through the comparison between the cultural values above and more modern cultural values derived from selected recent surveys and relevant studies as elaborated in the following sections.

5.1 Floodplain management cultures in the Rhine-Meuse delta region

This section presents the analysis and interpretation of cultural values regarding resource management and social organisation aspects in floodplain management in the Rhine-Meuse delta region. The cultural values regarding these two management typologies are elaborated separately in the subsequent sub-sections. The interpretation and classification of Dutch cultural values and traditions in resource management and social organisation is based on the analysis of three categories of parameters.

The interpretation and classification of Dutch cultural values and traditions in resource management and social organisation is based on the analysis of three categories of parameters. The first category is the Christian world view, which is taken as a parameter presenting predominant core values adopted by the society in the past. This is because Christianity was the dominant belief system at the time when the reclamation process in the delta flourished. The analysis takes into consideration variations of

the values and world views offered by Catholicism and Protestantism. This is because they are associated with different conceptions, especially regarding human-human relationships, and imply distinctive social organisation approaches. The analysis is based on available literature that interprets general Christian principles, not the specific values in Christianity that applied particularly to the Dutch society. This is due to time and resource limitations mentioned earlier in Chapter 1. The interpreted values are highlighted in Figure 31 and Figure 32 with a light-orange colour. The transposition of cultural values present in these parameters into the diagrams as an ideal type is the author's judgement based primarily on discussions in previous studies.

The second category of parameters includes previous studies that are directly relevant to aspects of water management. The sources used for the analysis of the Dutch case include de Groot and de Groot (2009) and Terpstra (2010). Cultural values derived from these sources are highlighted in Figure 31 and Figure 32 with a dark-orange colour. The position of these parameters as ideal types shown in the diagrams is a transposition of the data provided by those relevant studies by which the author relates them to comparable dimensions of culture characterising floodplain management employed in this work. This transposition is possible because these studies explain water management using comparable dimensions of culture employed in this study.

The third category is the quantitative data taken from selected surveys on cultural values taken internationally. These sources of data include the World Values Survey (WVS) and the Hofstede's surveys on national cultures. These sources of evidence are used as parameters of the rather recent cultural values in relation to aspects of organisational management in general as well as those regarding environmental management. The WVS data used for the analysis of the Dutch case are based mainly on the survey carried out in 2006, with some parameters from the data set of 1999 (see Section 3.3.3 for further detail of the questions and the data set). These values are highlighted in Figure 31 and Figure 32 with a grey colour. The light grey symbols present values relating to the dimensions of culture of the horizontal axis; the dark grey symbols for those on the vertical axis. The bigger the size of the symbols, the more relevance of the parameter to explain floodplain management culture. The position of the circles is assigned proportionately to values present in the original data sources.

5.1.1 Conceptions of the human-nature relationship and resource management cultures

Figure 31 illustrates the conceptions of the human-nature relationship and cultures regarding resource management in Dutch society that is derived from the analysis of different sources of evidence. The vertical axis presents 'uncertainty avoidance', which

refers to the degree of (in)tolerance to ambiguity of actors, whether to try to avoid floods in their habitat or to allow floods to take place and then take action to deal with the situation. The horizontal axis presents the 'nature integration' dimension, which refers to the ways people deal with problems, whether to adapt the environment for the benefit of humans or to adapt the way in which they interact with nature so as to be in harmony with the whole integrated social-ecological system. These two axes then make four ideal types of resource management – the 'controlling of nature', the 'adapting together with nature', the 'manipulating of nature' and the 'living with nature' types. See Section 3.3.2 for further description of each ideal type.

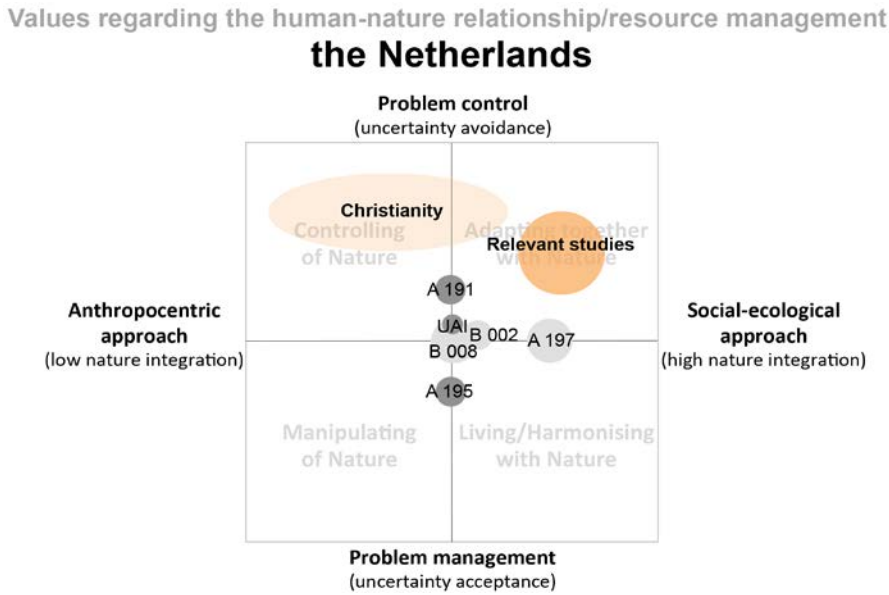

Figure 31
Conceptions of the human-nature relationship and cultures regarding resource management in Dutch society

Cultural values in Christian principles

The conceptions of the human-nature relationship present in Christian principles were interpreted based on two distinctive views. One group of scholars (such as Attfield 1983 and White 1967) interpreted Christian beliefs about the human-nature relationship as humans being made in God's image and set apart from nature; the entirety of physical creation was brought into being for the benefit of humans. Another group of scholars (such as Passmore 1974) argued that Christian beliefs concerning the human-nature relationship can be interpreted as humans being the stewards or caretakers of God's creation (referring to nature).

The interpretations above show that despite their commonality on Christian principles regarding the uncertainty avoidance dimension, their views regarding the nature integration dimension were rather different. Regarding the uncertainty avoidance dimension, Christian principles were interpreted by these two groups as strongly corresponding to a sense of human dominion over nature. Although the human dominion over nature does not directly refer to the high degree of uncertainty avoidance conception, it implies a propensity towards a high degree of control over nature and problems in resource management.

Regarding the nature integration dimension, the interpretation of the latter group implies a higher degree of nature integration than the first approach of interpretation. In other words, the first approach of interpretation refers to the 'controlling of nature' management type with a strong anthropocentric approach, whereas the latter corresponds to the stewardship of nature, implying a lower degree of anthropocentric centrism (more integration with nature). This view of the human-nature relationship in Christian principles as the stewardship of nature occurred during the late 1970s. This variation is illustrated in Figure 31 as an oval shape positioning towards the pole of problem control (a high degree of uncertainty avoidance) and slightly extending from an anthropocentric approach into the social-ecological approach.

Cultural values reported in relevant studies

There have been a number of recent studies and surveys about public perceptions of water management in the Netherlands. A survey on public perceptions in communities located along the floodplain of the Waal (one of distributaries of the Rhine) towards the 'Room for the River' programme is an example of those studies. This study reveals a general disagreement about the mastery over nature but an adherence to the stewardship of nature (de Groot and de Groot 2009). This indicates a similar conception of the human-nature relationship as the view of Christian principles interpreted by the latter group explained above. The similarity is especially evident regarding a high degree of nature integration. This propensity towards a social-ecological integration approach (high degree of nature integration) can also be seen from all the parameters used for the interpretation of the data provided by selected international surveys. Those parameters are taken from selected international surveys on culture, as explained below.

Cultural values collected by international surveys

In general, the data provided by the international surveys used in this work show variations in cultural values regarding the uncertainty dimension in Dutch society. Yet, propensity towards social-ecological integration is rather evident. Table 5 shows the values used for the analysis and an explanation below. The table presents both raw data taken directly from the surveys and data further analysed by the author. Only the

average values and the national values are raw data taken directly from the database. The rest are analysed by the author based on raw data for the purposes of analysis in this work (see explanation of the meaning of values shown in the table within the footnotes).[7]

Parameters		Average (all nations)	National value	Skewness	Kurtosis	Uniform
Uncertainty avoidance						
Hofstede_UAI	Uncertainty avoidance indicator	68	53	N/A	N/A	N/A
WVS_A 191	Avoid dangerous things	79.8%	64.1%	0.221	-0.953	X
WVS_A 195 (inverse)	Prefer a life with adventure and risk taking	59.3%	63.8%	-0.441	-0.712	X
Nature integration						
WVS_A 197	Care for and look after nature	81.4%	73.4%	0.441	-0.504	X
WVS_B 008	Prioritise environmental protection over economic growth promotion	57.4%	51.8%	N/A	N/A	X
WVS_B 002*	Agree to pay more taxes to prevent environmental pollution	57.3%	54.9%	0.083	-0.382	X

Table 5

Analysis of the parameters in relation to the uncertainty avoidance and the nature integration dimensions of management in Dutch society

*Note: The code in the first column refers to the code given to the questions/parameters in the surveys. The symbol * indicates the use of data from the fourth-wave survey (1999) of the WVS. The other parameters without * are data from the fifth-wave survey (2006). See more details about explanation of the methods for analysis in Chapter 3 and the detailed data in Annex A-1.*

7 The interpretation of the values is based on two fundamental principles. These principles apply to all subsequent interpretations of the data from the WVS and Hofstede's cultural values. The first principle is that the higher the percentage number, the higher degree towards the positive values of that dimension of culture. For instance, a large number of values regarding nature integration refers to a high propensity towards social-ecological integration management approach; and the propensity towards a anthropocentric approach for a-small number of values. This is with exceptions for those indicated with 'inverse' in brackets and in italics, which are to be interpreted inversely. The second principle is that a uniform culture is assessed holistically using three parameters together –(i) high percentage of respondent, (ii) high skewness (regardless of whether it is positive or negative) and (iii) positive with a high kurtosis value (see Section 3.3.3 for further detail of the interpretation).

The variations regarding the uncertainty avoidance dimension can be seen from the marginal propensity in different parameters towards different poles. Together with the low degree of skewness and a relatively flat curve, the data reveals a rather high degree of variation in cultural values regarding nature integration in Dutch society. Nevertheless, it should be noted that the parameters from the WVS (n.d.) and Hofstede's (2011) studies that are used for the analysis here are related only to general aspects of life and organisation management. This is because the parameters that are particularly related to aspects of environmental and water management are not available in the data provided by the international surveys used in this work. This means the values taken from the analysis above may not accurately represent the cultural values that relate directly to management of flood-related issues.

Regarding the nature integration dimension, values in Table 5 shows a significant difference between the three selected parameters used for the analysis. The noticeable difference is that the propensity towards social-ecological integration is rather high at the conceptual level of the human-nature relationship. Yet, the differences between the two poles are quite marginal at the practical level of resource management. In other words, the present values regarding human-nature relationship in general seem rather uniform to a 'social-ecological integration' management approach, but rather diverse when it comes to the particular issues of environmental and resource management in practice.

The above observation may imply that the Dutch are likely to agree with the idea that human and nature are equal. But when it comes to attitudes regarding resource management, they tend to put humans at the centre of management by adapting the environment for the benefit of humans, rather than to position humans as part of a bigger system, and adapt the way they interact with nature to be in harmony with the whole integrated system. This shows that although the general core values are strongly correlated to the world views and norms of a society, there are other factors that significantly affect the values regarding the specific issue of management. These issues and assumptions are further investigated in the subsequent chapters. In addition, these values when compared with the cultural values of all the nations surveyed correspond to a considerably lower degree of nature integration than the average values found. This is probably the expression of the remaining of the anthropocentric traditions in resource management influenced by Christian principles.

Summary

The analysis and interpretation of cultural values from different sources and parameters show that Dutch conceptions of the human-nature relationship and resource management have a propensity towards a high degree of uncertainty avoidance and nature integration. Yet, cultural values interpreted from different parameters show a high degree of variation, especially regarding the nature integration

dimension. For instance, there are two different views on Christian principles regarding the human-nature relationship. They are different in terms of the degree of anthropocentrism. This study argues that this view probably shows influences of the environmental discourses of that period. This argument is supported by the fact that the view of human-nature relationship in Christian principles as the stewardship of nature became apparent in the late 1970s, the period that environmental discourses blossomed. In addition, this interpretation conforms to the cultural values shown in recent studies and surveys of cultures regarding environmental and water management in the Netherlands, including de Groot and de Groot (2009), Hofstede (2011) and the World Values Survey (WVS n.d.). In other words, the previously mentioned variation of cultural values shown in different sources of evidence used for the analysis in this work probably informs the evolution of cultural values. This issue is further investigated in Chapter 9, using a framework for understanding culture and its relevance to territorial management processes from a diachronic perspective.

5.1.2 Conceptions of the human-human relationship and social organisation cultures

Figure 32 illustrates the interpreted conceptions of the human-human relationship and cultures regarding social organisation in Dutch society. The vertical axis presents the 'power distance', which refers to the degree of authority or responsibility in the management of floodplain that one or more actors have over the others. The horizontal axis presents the 'social integration' dimension, which refers to the degree of association between actors in a given territory with regards to the management of flood-related issues. These two axes then make four ideal types of society - the 'dependent society', the 'hierarchical society', the 'individualistic society' and the 'communal society'. See Section 3.3.2 for further descriptions of each ideal type.

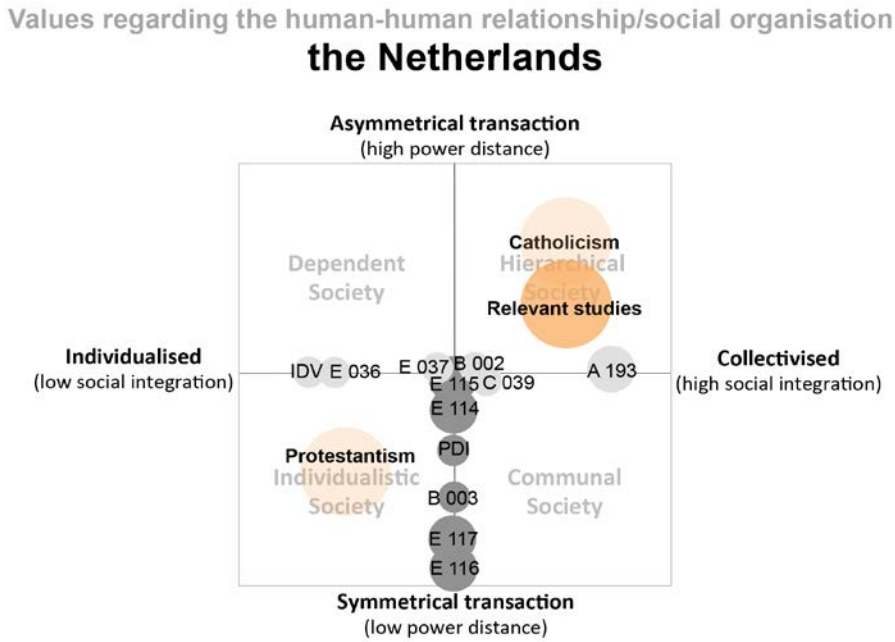

Figure 32
Conceptions of the human-human relationship and cultures regarding social organisation in Dutch society

Cultural values in Christian principles

For the analysis of core values present in religion, two branches of Christianity - Catholicism and Protestantism - are analysed separately. This is because they were predominant in the Rhine-Meuse delta in different periods. Catholicism became predominant in most parts of the country a few centuries before the establishment of the first water board in the thirteenth century. The influences of Protestantism started in the northern part of the country in the fourteenth century and became prevalent in the seventeenth century, mainly in the north and the west of the present-day Netherlands (Israel 1995; Knippenberg 1998). More importantly, they are associated with different conceptions of the human-human relationship, which imply distinctive social organisation approaches, as described below.

Generally, the two branches of Christianity share a common purpose of social organisation, which is to serve individual interests based on the Free Will of actors subject to an inscrutable divine providence (Cole 2008). Yet, their associated social organisation structures are diverse. The differences were expressed in the priest's roles and justification principles. The fundamental principles in Protestantism consider the Bible as the sole source of authority with a universal priesthood of believers and the justification by faith alone (with common grace) (Cole 2008). This made Protestantism

a religion that supports a relatively more symmetrical transaction in social organisation than Catholicism. Catholicism is associated with a high degree of clergy authority and hierarchy in the monastic community. The requirement for participating in the liturgical life of the Catholic Church indirectly generates a collective sense of community, which may or may not take place under the fundamental principles of Protestantism listed above. This implies a lower degree of 'collectivism' in Protestant social organisation structures over that of Catholicism.

The above interpretation implies the correspondence of the social organisation structures in Catholicism to the 'hierarchical' type of social organisation (which functions collectively under the considerably asymmetrical authoritative structure) and that of Protestantism to the 'individualistic' type of social organisation (which functions individually under the more symmetrical authoritative structure). This study investigates further in Chapter 9 whether this difference affected the evolution of formal institutions in water management in the Dutch context, using the framework to understand dynamics of cultures in floodplain management from a diachronic perspective.

Cultural values reported in relevant studies

The survey on flood preparedness performed in flood prone areas in the Netherlands carried out by Terpstra (2010) is used for the analysis and interpretation of cultural values from relevant studies of the Dutch case. Figure 33 shows the information derived from Terpstra's (2010) study. It shows a considerably higher share of expectations for the government's responsibility to prevent flood damage. However, it shows also a rather high share of realisation for individual's responsibility in preparedness for flood disasters. This implies that present values regarding social organisation in management in general in Dutch society correspond with the 'individualistic' type of management. Yet, when it comes to aspects of management of flood-related issues in particular, the 'hierarchical' type of conceptions is strongly predominant. This predominance of the 'hierarchical' type of management cultures conforms to the interpretation of principles in Catholicism, which is argued in this study as an informal institution providing underlying norms, traditions and cultures in social organisation of Dutch society. This issue is further elaborated in Chapter 9.

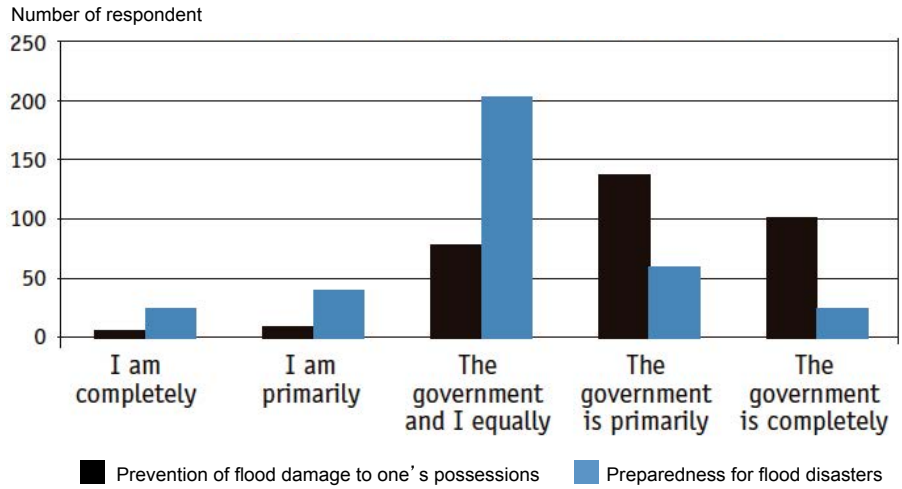

Figure 33
Distributions of respondents' attitudes regarding responsibility for management of flood disaster
Source: Terpstra (2010, 64)

Cultural values collected by international surveys

As aforementioned, the two branches of Christianity are associated with different conceptions of the human-human relationship and imply distinctive social organisation approaches. Cultural values collected by the international surveys used for analysis in this work rather conform to the 'individualistic' type of social organisation present in Protestantism. Table 6 summarises the values regarding the power distance and social integration dimensions in Dutch society, which are taken from the most recent database from the WVS and Hofstede's studies about national cultures. However, it should be noted that most of the parameters used for the analysis are related to general aspects of life and organisation management; only two parameters are directly related to the aspects of environmental management. The interpretation method is similar to that explained earlier in Section 5.1.1.

Parameters		Average (all nations)	National value	Skewness	Kurtosis	Uniform
Power distance						
Hofstede_PDI	Power distance indicator	59	38	N/A	N/A	N/A
WVS_E 114	Agree with governing led by leader who does not come from election	38.1%	41.6%	-0.115	-1.102	X
WVS_E 115	Agree with governing guided by experts	59.0%	52.2%	0.239	-0.630	X
WVS_E 116	Agree with governing under army rules	24.9%	7.4%	-1.538	1.625	/
WVS_E 117 *(inverse)*	Agree with governing based on democratic political system	*91.6%*	*91.7%*	0.935	1.063	/
WVS_B 003*	Environmental management is the state's responsibility, not individuals	71.2%	23.2%	-0.808	0.924	/
Social integration						
Hofstede_IDV *(inverse)*	Individualism indicator	*45*	*80*	N/A	N/A	N/A
WVS_C 039*	Agree that 'work is a duty toward society'	75.8%	58.9%	0.491	-0.642	X
WVS_A 193	Care for well-being of people nearby	85.7%	86.5%	0.806	0.278	X
WVS_E 036 *(inverse)*	Prefer privatisation in business and industry over governmental control	*47.4%*	*22.5%*	0.025	-0.816	/
WVS_E 037*	People's well-being is the state's responsibility	38.6%	47.2%	0.143	-0.694	/
WVS_B 002*	Agree to pay more taxes to prevent environmental pollution	57.3%	54.9%	N/A	N/A	/

Table 6
Analysis of the parameters in relation to the power distance and the social integration dimensions of management in Dutch society
Note: Interpretation of the table is based on the same explanations used for Table 5

The values in the table show the considerably strong propensity towards a low degree of power distance in Dutch society, with a high degree of variation regarding the social integration dimension. The variation can be seen from the different propensity in different parameters towards the individualised and collectivised approaches. This is true when considered either in absolute values or in comparison to the average values of all nations taken in the surveys. This may imply that the Dutch are likely to agree with the symmetrical transaction in management of resources. Yet, their attitudes

towards individual-based and collective-based management approaches could vary significantly. Another observation regards the paradox of cultures regarding the social integration dimension. Different values of the different parameters reveal the likely predominance of individual conceptions with strong roles given to the state to ensure collective benefits (such as for people's well-being).

Summary

In short, the analysis of different sources of evidence shows a variation of cultural values present in the different sources, both regarding the power distance and the social integration dimensions. The strong propensity towards a low degree of power distance present in the cultural values collected by the international surveys conforms to the interpretation of the Protestant principles. Yet, this is rather different from the propensity towards the high degree of power distance present in Catholic principles and the information provided by a survey on flood preparedness performed in flood prone areas in the Netherlands carried out by Terpstra (2010). The conformity between cultural values present in the Catholic principles and Terpstra's (2010) study is observed also regarding a high degree of collectivism in the social integration dimension. Possible reasons explaining this conformity and variation are investigated and elaborated in Chapter 9.

5.2 Floodplain management cultures in the Chaophraya delta region

Similar to the analysis of the Rhine-Meuse delta region, the interpretation and classification of cultural values and traditions in resource management and social organisation of the Chaophraya delta region is based on the analysis of three categories of parameters. This applies also to the transposition of the interpreted cultural values present in all three categories of parameters into the management typology diagrams.

The first category refers to the analysis of principles in Theravada Buddhism with a strong integration of indigenous pagan animist beliefs and Hindu rituals. This is taken as a parameter presenting underlying normative values that underpinned decision-making in the Thai context. This is because this specific belief system has been the predominant belief system adopted in the region. In addition, core values are also interpreted from traditions, languages and rituals that are directly relevant to management of water and flooding. The interpreted values are highlighted in Figure 34 and Figure 35 with a light-blue colour.

The second category of parameters is based on previous studies that are directly relevant to aspects of water management. This kind of data sources for the Thai case is available only for the analysis in relation to social organisation aspects. The sources of this type include Molle *et al.* (2001) and Shigetomi (2003). Cultural values derived from the interpretation of parameters of this category are highlighted in Figure 34 and Figure 35 with dark-blue colour.

For the third category of parameters, the analysis of the Thai case uses the data set of Hofstede's surveys on national cultures and the WVS derived from the survey carried out in 2007. Similar to the analysis of the Dutch case, the light grey symbols present values relating to the dimensions of culture of the horizontal axis; the dark grey symbols for those of the vertical axis. The bigger size of the symbols, the more relevance of the parameter to explain floodplain management cultures.

In addition, the analysis in the case of the Chaophraya delta region is carried out at two levels, which are the nation/regional level and the local (district) level. The analysis at the local level (i.e. sub-national analysis) investigates whether there are variations of cultures within the region. This is based on the semi-structured interviews with the respondents who live in the three selected districts in the Chaophraya delta region, which is carried out in this study.

5.2.1 Conceptions of the human-nature relationship and resource management cultures

Analysis at the national/regional level

Figure 34 illustrates the conceptions of the human-nature relationship and cultures regarding resource management in Thai society interpreted from different sources of evidence used for the analysis in this study. Interpretation of the diagram is based on the similar principles explained in Section 5.1

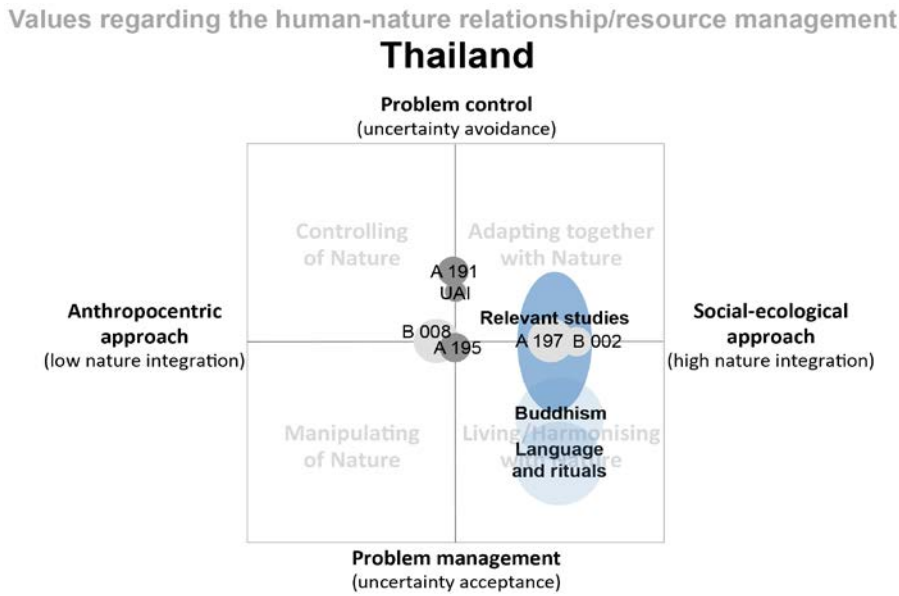

Figure 34
Conceptions of the human-nature relationship and cultures regarding resource management in Thai society

Cultural values in the Thai belief system

The interpretation of cultural values in the Thai belief system is based on the analysis of Theravada Buddhism, indigenous pagan animist beliefs and Hindu rituals. These three elements have been integrated and form the fundamental normative system that is argued as underpinning decision-making in the Thai context. Regarding the uncertainty avoidance dimension, the Buddhist principles show the conceptions corresponding to the considerably high degree of uncertainty acceptance. This is present in one of the three fundamental principles in Theravada Buddhism, namely '*Anija*', professes that impermanence and uncertainty are the fundamental truths of nature; any compound form in the universe whether a tree, a cloud, a human being, a thought or a molecule, is subject to change (Swearer 2005).

Regarding the nature integration dimension, the predominance of values towards 'social-ecological integration' approach is rather evident in the world views of the Thai belief system. The high degree of nature integration is professed in Theravada Buddhist world views about the human-nature relationship, namely that all living beings are equal and that we are to live our lives harmoniously with nature (Rigg 1995; de Silva 1998; Payutto 1995; Williams and Tucker 1997). This conforms to the beliefs in the existence of non-human spiritual beings in pagan animism, which regards human beings as part of nature that is equal to and in cooperation with other animals, plants and natural forces (Callicott and Ames 1989).

These world views and beliefs imply a moral imperative to treat these non-human agents with respect and being in harmony with them.[8]

Cultural values present in traditions and languages

The traditional Thai way of classifying seasons distinguished seasons into a dry season and wet (raining) season (Nontnart 2011; Jumsai and Buckminster Fuller 1988). This implies the acceptance of flooding as a usual event (i.e. a low degree of uncertainty avoidance in floodplain management). The wet season in the Chaophraya delta region included the annual flooding period, which was called as the period of '*nahm-lahk*' [translation: water flow]. This type of flooding would usually cause the inundation of settlements for relatively short periods (a few days or a few weeks at a time). Several aquatic ceremonies, such as '*loy kratong*' and boat racing, take place during the '*nahm-lahk*' period, to worship the goddess of the river and to celebrate fertility brought by the water (Jumsai and Buckminster Fuller 1988). These traditions show that people accepted living with floods that are associated with a low degree of exposure as part of their ways of life. Floods would be conceived as being problematic only in years with an extreme excess of water, which would cause a long period of inundation in settlements that lasted for several months (usually 2 to 4 months). This type of flood was called '*nahm-tuam*' [translation: submergence].

Regarding the nature integration dimension, the close relationship of traditional Thai ways of life with water was also observed from the analysis of the Thai language. The traditional way of assigning a name to a district in the region usually describes the topography of the area whether it is a high ground (named with the words like '*khok*' and '*don*') or a low-lying area (named with the words like '*toong*', '*beung*', '*nong*' and '*lad*'). These names provide information to people on which part of the region is suitable for settlements. The interpretation of the terms above is that in the Thai context of territorial development, concerns are given to natural topography in relation to the possible flood exposure of the area.[9]

8 The conceptions present in the Thai belief system conform to the idea of deep ecology - a contemporary ecological philosophy formed in the contemporary ecological ethics (Sponsel and Natadecha-Sponsel 1995). In deep ecology, the natural world is a subtle balance of complex inter-relationships in which the existence of organisms is dependent on the existence of others within ecosystems (Jacobs 1995).

9 The use of language to explain natural topography exists also in Dutch language. This includes, for instance, *-donk, -geest, -woud* and *-veen*, which are the terms assigned to the name of settlements located in different kinds of landscape. However, due to limitations of this study as mentioned earlier, further study by a native is recommended before concluding whether the terms strongly relate to people's perception on the possible flood exposure of the area.

In short, the analysis above shows that conceptions of human-nature integration present in the traditional rituals and language practised in Thailand evidently correspond to the 'living with nature' type. This type of conception conforms to the conceptions present in the Thai belief system explained earlier.

Cultural values reported in relevant studies

A number of studies (such as Sponsel and Natadecha-Sponsel 1995 and Rigg 1995) have indicated that the dominance of environmental and natural resource management approaches corresponds to the high degree of nature integration in Thailand. Many of these studies argued that these management approaches are closely related to the Buddhist framework practised in Thailand. Rigg (1995) argued that the way of life under the Buddhist framework encourages management of the environment through internal human development. This way of life emphasises configuring one's needs and resources so that they coincide in self-sufficiency and autonomy (Roe 1998). The development of the external environment, including social, economic and ecological conditions, serve only to facilitate the process of internal development of humans (Payutto 1995). This means that the traditional Thai normative systems correspond strongly to the 'living with nature' resource management approach that integrates also with the 'adapting together with nature' approach.

Cultural values collected by international surveys

Table 7 shows cultural values regarding the uncertainty avoidance and nature integration dimensions in Thai society, which are taken from the most recent database from the WVS and Hofstede's studies about national cultures. In contrast to the cultural values present in the other sources used in this study, the cultural values collected by Hofstede's studies and the WVS show a slight propensity towards a high degree of uncertainty avoidance. This can be inferred from the slightly higher percentage share of the respondents who agreed with the uncertainty avoidance ways of life and management approaches. Together with a low degree of skewness and the relatively flat curve, the data reveals a high degree of variation of cultural values regarding uncertainty avoidance in Thai society. Yet, in comparative terms, Thai cultural values seem to correspond with a slightly lower degree of uncertainty avoidance than the average values of all the other nations taken in the surveys.

Regarding the nature integration dimension, the cultural values collected by the Hofstede's studies and the WVS show the strong predominance of values towards 'social-ecological integration'. This is present shown in the considerably high share of respondents who have strong concerns about looking after nature and agreeing to pay more taxes to prevent environmental pollution. These values that emphasise a high degree of nature integration conforms to the values present in all of the other parameters used for the analysis here.

Parameters		Average (all nations)	National value	Skewness	Kurtosis	Uniform
Uncertainty avoidance						
Hofstede_UAI	Uncertainty avoidance indicator	68	64	N/A	N/A	N/A
WVS_A 191	Avoid dangerous things	79.8%	64.1%	0.190	-0.565	X
WVS_A 195 *(inverse)*	Prefer a life with adventure and risk taking	59.3%	55.7%	-0.117	-0.676	X
Nature integration						
WVS_A 197	Care for and look after nature	81.4%	73.7%	0.329	-0.289	/
WVS_B 008	Prioritise environmental protection over economic growth promotion	57.4%	47.8%	N/A	N/A	X
WVS_B 002*	Agree to pay more taxes to prevent environmental pollution	57.3%	74.2%	0.314	0.428	/

Table 7
Analysis of the parameters in relation to the uncertainty avoidance and nature integration dimensions of management in Thai society
Note: Interpretation of the table is based on the same explanations used for Table 5

Summary

In general, the results from different sources of evidence of the Thai case show rather diverse conceptions regarding the uncertainty avoidance dimension, but a strong predominance of the 'social-ecological integration' management approach (with high degree of nature integration). It could be concluded that the conformity regarding the high degree of nature integration is probably underlined by principles in Theravada Buddhism and pagan animism. Theravada Buddhism and pagan animism together have formed the traditional normative systems regarding the human-nature relationship, which have underpinned cultural values regarding resource management in the Thai context, especially in the past. This is evident in the Thai language and traditional rituals and ceremonies practised in Thailand. The cultural values associated with a high degree of nature integration have then been maintained in present cultural values, as shown in the cultural values collected by the international surveys.

Based on a similar rationale, the non-conformity regarding the uncertainty avoidance dimension present in different sources analysed here possibly implies that traditional cultures in management of flood-related issues that corresponded with a low degree of uncertainty avoidance may have changed towards a higher degree of uncertainty avoidance. This argument is further investigated in Chapter 9, which includes the analysis of cultures from a diachronic perspective.

Variation of culture at the sub-national level

In the semi-structured interviews carried out in this study, there were two groups of questions that aimed at investigating values of the respondents in the management of flood-related issues at the sub-national level of analysis. One group consists of questions related to conceptions of the human-nature relationship in general. Another group consists of questions about attitudes towards policies associated with various types of management approaches. Below is the summary of the results derived from the interviews (see Annex A-2 for further detail).

For the general questions about conceptions of the human-nature relationship, the interviews show variations of values given to the nature integration dimension in all districts. Yet a slight propensity towards a high degree of nature integration is observed. This is expressed in how slightly more respondents agreed with the statements '*by integrating with nature, humans can understand the world better*' and '*we do not need to maintain or take care of the natural substances that are not useful for humans*' than those who disagreed. The propensity towards a high degree of nature integration conforms to the values interpreted from the analysis at the national level, as well as to the respondents' attitudes towards various types of policies asked in the interviews (see paragraph below). Regarding the uncertainty avoidance dimension, the interviews show considerably uniform conceptions towards a low degree of uncertainty avoidance across the three districts, yet with slight differences amongst them. Respondents in Khlongluang were likely to accept less uncertainty than those living in the other two districts surveyed. Respondents in Bangkhuntien tended to accept uncertain situations to the highest level amongst the three districts. This difference across the districts is expressed in their different degrees of agreement towards the statements '*things are subjected to changes and uncertain*' and '*nature has certain patterns and is predictable, so that humans can forecast and avoid natural disasters*'. This difference was more apparent when the respondents' attitudes towards various types of policies were considered, as described below.

For the specific questions about attitudes towards various types of policies, most of the respondents generally agreed with all of the four resource management types of policy. Yet, three major points were observed. First, all respondents agreed with the policies that aim to mitigate problems and negative effects brought on by floods by bringing back a balance to the ecological system. Second, the highest level of disagreement concerned policies to install temporary flood barriers and water pumps. These two observed points show the propensity of respondent's conceptions in all districts towards the 'social-ecological integration' approach. The third remark is that the share of respondents who disagreed with the temporary installation of flood barriers was highest in Bangkhuntien. The reason given by this group of respondents was that '*water comes by nature and will go by itself; there is no need for human intervention*'. Apart from the evidence of cultural values favourable towards 'social-ecological integration'

present in this rationale, this statement also implies a high degree of acceptance of uncertainty of the respondents living in Bangkhuntien. This difference across districts implies a higher correspondence with 'living with nature' type of conceptions in the human-nature relationship and cultures regarding resource management in relation to flood-related districts.

In short, the analysis at the sub-national level shows that people living in the three districts are likely to share common conceptions of the human-nature relationship and cultures regarding resource management. These common conceptions and cultures refer to attitudes towards floods and the management of related problems that correspond to problem acceptance (a low degree of uncertainty avoidance) and being integrated with nature (a high degree of nature integration) approaches. Yet, this occurred in different degrees in the three districts. The propensity towards a low degree of uncertainty avoidance is lowest in Khlongluang; and the propensity towards a high degree of nature integration is highest in Bangkhuntien. The variations of these values across districts show possible influences of other factors rather than assuming a common institutional framework at the national level shared by the three districts. This argument is further investigated in Chapter 9, using the conceptual framework to understand interrelationships between physical factors, cultural factors and their influences in decision-making processes from a diachronic perspective.

5.2.2 Conceptions of the human-human relationship and social organisation cultures

Analysis at the national/regional level

Figure 35 illustrates the interpretation of conceptions of the human-human relationship and cultures regarding social organisation in Thai society explored in this study. Interpretation of the diagram is based on similar principles explained in Section 5.1.2.

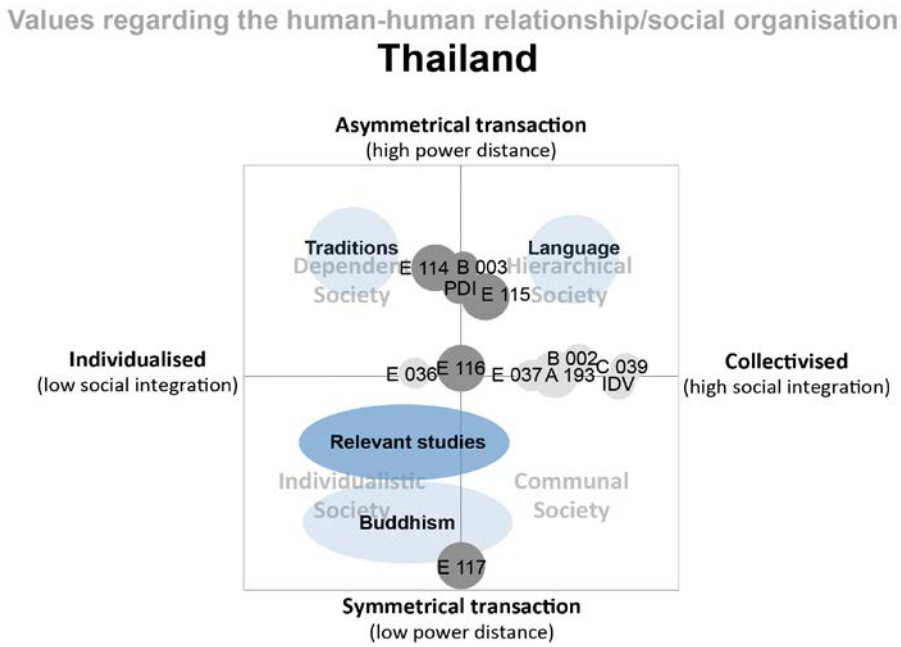

Figure 35
Conceptions of the human-human relationship and cultures regarding social organisation in Thai society

Cultural values in the Thai belief system

In Theravada Buddhism, the dominance of the 'individualistic' type of conceptions of the human-human relationship and social organisation, associated with a low degree of power distance and social integration, is rather evident (Mulder 1992; Bunnag 1971). Regarding the power distance dimension, Theravada Buddhist world views are associated with a non-hierarchical authority structure in several ways. Its fundamental principle states that everyone, including the Buddha, is considered equal as all human beings, who are subject to the same sources of sufferings (Jayasuriya 2008). In addition, the teachings of the Buddha are not to be believed based only on faith; enlightenment can only be achieved through one's direct experiences and personal realisation through critical investigation and reasoning on the true nature of reality (Jayasuriya 2008).

Regarding the dimension of social integration, Theravada Buddhist world views suggest that every individual is responsible for their own self-awakening and liberation, as they are the ones who are responsible for their own actions and the consequences. However, individuals, according to Theravada Buddhism, are bound loosely by indirect collective concerns. This is expressed in one of the fundamental Buddhist principles for being attentive towards our actions and thoughts not to affect others, including all living

beings (Callicott and Ames 1989). This multi-faceted approach regarding the social integration dimension in Theravada Buddhism is illustrated in the above diagram as a light-blue oval-shape, positioned as an individualistic type of society that is also bound to the communal type.

Cultural values present in traditions and languages

The traditional Thai social structure and organisation is based on a form of '*nai-prai*' [translation: 'patron-client'] relationship, which was in use until the country's modernisation in the late nineteenth century. The '*nai-prai*' relationships refer to the system in which *nai* (master) provided supports for *prai* (commoners) who had to share the produce of the land with their masters (Chitchang 2006). Regarding the power distance dimension, the cultural values implied by this traditional social structure and organisation rather corresponds to asymmetrical transaction characteristics (high degree of power distance). This is in contrast to the rather symmetrical transaction characteristics (low degree of power distance) present in Theravada Buddhist world views. Through this social structure, reciprocity amongst people from different social status was applied based on individual connections rather than collective institutional ones (Arghiros 1992; Hanks 1975, cited in Molle *et al.* 2001). This implies the correspondence of individualised characteristics (a low degree of social integration) in Thai traditions. In short, the characteristics of the '*nai-prai*' relationships correspond to the 'dependent' type of society defined in this study, which is associated with asymmetrical transactions and the individualised characteristics of social contact.

The 'hierarchical' type of social organisation present in '*nai-prai*' relationships conforms to the cultural values present in the Thai language. The asymmetrical transaction characteristics are expressed in the Thai language through the uses of different terms for pronouns and verbs that identify the social status or hierarchical position of the particular person (Vongvipanond 1994). Yet, in contrast to the individualist characteristics present in the Thai belief system and the traditional social organisation explained above, there are several aspects in the Thai language that express cultural traits corresponding to the collectivised characteristics in social relations. The expression of these collectivised characteristics is evident, for instance, in the spoken form of the Thai language, in which speakers often use pronouns based on terms used for family members to represent the level of seniority of people involved in the conversation.

Cultural values reported in relevant studies

As described previously, the characteristics regarding social organisation present in Theravada Buddhism corresponds largely to the individualist type in which collectiveness is also an important concern. This cultural characteristic is also reported in many studies, such as Shigetomi (2003) and Molle *et al.* (2001). Shigetomi (2003) observed and argued that Buddhist temples are significant informal institutions that underpin the delivery of collective tasks in Thai society. Through cooperation with temples, people collectively mobilise resources through personal networks spreading from core members, who are usually volunteers receiving work duties assigned by the abbot (Shigetomi 2003). This shows a specific form of social organisation in the Thai context, in which society is managed based on the 'individualistic' approach but at the same time is loosely bound by informal institutions, which support the execution of collective tasks when necessary.

Yet, the rather diverse values regarding social organisation in Thai society have been observed in several studies about Thai culture regarding social models and management of the environment and natural resources. These studies include, for instance, Molle *et al.* (2001, 15), which stated that '*... there have been wide academic debate, but little consensus, on the specific of the Thai society...*'. A reason that can possibly explain this is a variation of cultural values and social models present in different regions of the country. This issue of a variation is used to explain the different cultural values shown in different sources, as elaborated below.

Cultural values collected by international surveys

Table 8 shows the cultural values in relation to the power distance and social integration dimensions in present-day Thai society derived from the analysis of cultural values provided by Hofstede's studies and the WVS. It shows the propensity of values towards a 'hierarchical' type of society. This refers to the type of society in which asymmetrical transactions and collectivised characteristics of social contact are predominant. The propensity towards a 'hierarchical' type of society is even stronger when the cultural values are compared to the average values of all the nations surveyed. However, Hofstede (2011) mentioned that the degree of power distance and collectivised characteristics in Thai society are generally lower than those in other Asian countries.

Parameters		Average (all nations)	National value	Skewness	Kurtosis	Uniform
Power distance						
Hofstede_PDI	Power distance indicator	59	64	N/A	N/A	N/A
WVS_E 114	Agree with governing led by leader who does not come from election	38.1%	70.8%	0.215	-0.158	/
WVS_E 115	Agree with governing guided by experts	59.0%	63.1%	0.252	-0.096	X
WVS_E 116	Agree with governing under army rules	24.9%	53.5%	0.074	-0.374	X
WVS_E 117 (inverse)	Agree with governing based on democratic political system	91.6%	92.6%	0.627	0.020	/
WVS_B 003*	Environmental management is the state's responsibility, not individuals	71.2%	66.0%	0.107	-0.397	X
Social integration						
Hofstede_IDV (inverse)	Individualism indicator	45	20	N/A	N/A	N/A
WVS_C 039*	Agree that 'work is a duty toward society'	75.8%	82.3%	0.708	1.104	/
WVS_A 193	Care for well-being of people nearby	85.7%	67.4%	0.190	-0.286	X
WVS_E 036 (inverse)	Prefer privatisation in business and industry over governmental control	47.4%	67.1%	-0.624	0.045	X
WVS_E 037*	People's well-being is the state's responsibility	38.6%	63.4%	0.580	-0.468	X
WVS_B 002*	Agree to pay more taxes to prevent environmental pollution	57.3%	74.2%	0.314	0.428	/

Table 8
Analysis of the parameters in relation to the power distance and the social integration dimensions of management in Thai society
Note: Interpretation of the table is based on the same explanations used for Table 5

These cultural values show the conformity with values interpreted from the Thai language and traditions (the '*nai-prai*' relationship) regarding the power distance dimension, but are different from the values present in the Theravada Buddhist framework. Regarding the social integration dimension, they reveal the conformity with the traditional social structure and organisation based on the '*nai-prai*' relationship and Theravada Buddhist world views, but are different from the values reflected in the Thai language.

Arguments in several previous studies help explain the above non-conformity of the values interpreted from different sources of evidence, especially regarding variations in individualism. For instance, the studies by Molle *et al.* (2001) and Shigetomi (2003) address variation regarding the social organisation model across different regions in Thailand. These studies suggest that the social organisation model practised in the central region (which includes the Chaophraya delta region) is associated with individualised characteristics with a lower degree of social contact than that of the other regions in the country. The differences are evident particularly comparing to the model practised in the north and the northeastern regions (Molle *et al.* 2001; Shigetomi 2003).

Summary

In general, the analysis and interpretation of cultural traits from different sources of evidence show rather diverse values concerning social organisation in the Thai case. The variation appears in both the power distance and the social integration dimensions. The observation of diverse values corresponds with the observations found in previous studies on the patterns of social interaction and organisation in the Chaophraya delta region, as stated above.

Observations regarding regional variation imply that the cultural values derived from studies and surveys carried out at the national level could be different from those carried out for the central region in particular. This study argues that the regional differences are probably related to the different ecological and historical settings across regions. In other words, different physical and social attributes across various territories are argued here as likely affecting cultures regarding social organisation, especially with regards to the degree of social integration. This argument is supported by the observed variations in cultural values of people living in different districts in the Thai case, as explained previously in Section 5.2.1 and as elaborated below in the analysis at the sub-national level. The issue is also further investigated in Chapter 9, using the framework for analysis that incorporates possible influences of other development conditions rather than common institutions in shaping decision-making from a diachronic perspective.

Variation of culture at the sub-national level

The interviews carried out in this study consist of questions regarding conceptions of the human-human relationship in general and questions about attitudes towards policies associated with various floodplain management approaches. From the questions regarding general conceptions, the interviews reveal noticeable variations across districts regarding the social integration dimension. Respondents in Khlongluang tended to have stronger individualised-based values when compared to the conceptions of respondents in the other two districts. This is observed from

their different degrees of agreement to two statements, which are '*humans are interdependent; we can survive only if we live together*' and '*natural resources were deteriorated because they belong to public, and thus were not taken care by any person*'. Variations of attitudes towards individualised and collectivised-based policies were also observed. Yet, the correlation between the different attitudes and districts was not evident. A possible explanation of this variation is that these values are influenced not only by institutional framework, which is applied at the national level and assumed to be shared by all three districts. But they are also influenced by other development conditions, such as physical and social attributes that may be different in each district.

Regarding the power distance dimension, the predominance of symmetrical transaction values (i.e. low degree of power distance) regarding the human-human relationships in general was rather evident in all three districts. These symmetrical transaction-based values conform to the cultural values present in Theravada Buddhist world views. Yet, the interviews show that attitudes of the respondents towards policies associated with symmetrical transaction management approaches were rather diverse. One particular observation in the interviews may help explain this paradox. The main reason given by the respondents who disagreed with policies that require contributions from all sectors of society (referring to symmetrical transaction-based management approaches) was that these policies might create unfair conditions for some groups of people, in terms of undue contributions. This rationale implies the values toward equality in human-human relationships as present in Theravada Buddhist world views. The evidence above shows the strong influences of belief systems in shaping core values regarding social organisation in the management of water and flood-related issues.

Nevertheless, it was also observed that most of the respondents in all three districts agreed with the policies associated with asymmetrical transaction management approaches. These values with positive attitudes towards management based on asymmetrical transactions conform to values present in the other sources of evidence taken in the analysis at the national level. The inconsistency between these asymmetrical transaction-based values and symmetrical transaction-based values present in the parameters mentioned in the previous paragraph might be explained by two arguments. First, the inconsistency might present changes of cultural values over time. It means that values present in the other sources of evidence are present-day values that may be different from the traditional values affected by the belief systems. Secondly, the inconsistency might imply differences between culture regarding social organisation in general and culture in social organisation regarding management of flood-related issues in particular. In other words, the way people organise their authoritative and administrative structures for management of flood-related issues might be influenced by different sets of values than those influencing general conceptions of the human-human relationship. These arguments are further investigated in Chapter 9.

5.3 Comparison of floodplain management cultures in the case studies

As aforementioned, this chapter aims to uncover the similarities and differences of cultures in relation to floodplain management in the case studies. The analysis of the predominant religions, languages, ceremonies and rituals shows the substantially distinctive cultural values regarding human-nature relationships and resource management in the two delta regions being studied. The analysis reveals that the 'controlling of nature' type of resource management was the predominant cultural value in the Dutch case, whereas the 'living with nature' type was predominant in the Thai case. This shows significant influences of core values affected by underlying world views on the shaping of cultures regarding resource management.

However, it was observed that cultural values interpreted from the other sources are different from those interpreted from the predominant religions, languages, ceremonies and rituals. These other sources include the WVS and Hofstede's study of national cultures as well as the other recent relevant studies being analysed. The analysis of these sources in the Dutch case shows propensity of values towards a higher degree of nature integration than values present in religions, languages, ceremonies and rituals. In the Thai case, the difference was more obvious regarding the uncertainty avoidance dimension than the nature integration dimension. The analysis of the data provided by international surveys shows the propensity of values towards high degree of uncertainty avoidance (i.e. problem control), which is different from the strong values towards uncertainty acceptance present in the religions, languages, ceremonies and rituals practised in the region.

The observations above entail an evolution of cultural values over time. In simple words, the values present in the other sources of evidence are argued as presenting more up-to-date values, which might be different from the traditional values affected by belief systems. This observation is an important issue that needs further investigation on the factors influencing cultural changes and the implications of these changes on policy design and planning practices.

The analysis shows not only differences in cultural values of the two regions, but also differences in values across districts in the same region. The sub-national comparison shows that the degrees of propensity of values towards high degree of uncertainty avoidance are different amongst the three districts in the Chaophraya delta region. These variations of cultural values in the three districts illustrate the likeliness of the influence of other factors than the core values in shaping cultural values regarding floodplain management in particular. The other factors may include the physical and social contexts in a given territory. This is because the three districts are assumed to share common institutional frameworks, both formal and informal institutions. But they are associated with different physical and social attributes.

This likeliness of the influences of factors other than the core values is present also from the analysis of culture in relation to social organisation aspects in floodplain management of the two delta regions. In both regions, the values regarding social integration in general aspects of management (as present in the parameters from the WVS and Hofstede's studies) are different from the values regarding social integration in water management in particular (according to studies mentioned). Similar to the argument given above, this study argues that the inconsistency of values regarding social integration dimension may present the influence of other factors (such as physical and social attributes) than the core values in shaping cultural values regarding floodplain management in particular. This argument is supported also by the variations of values regarding the social integration observed in the three districts from the sub-national analysis. The analysis also shows that the values regarding power distance derived from different sources are considerably inconsistent in both regions. However, the factors underpinning this inconsistency are not evident.

The above arguments regarding likeliness of influences of factors other than core values are further investigated in Chapter 9 using the conceptual framework for analysis from a relational perspective, which considers culture as interrelating to other development conditions. Investigating this issue from a relational perspective is necessary in this case because it helps enable an analysis that takes into consideration interconnected relationships between development conditions on the shaping of cultures. In addition, the conceptual framework in Chapter 9 offers an analytical approach from a diachronic perspective, which explores relationships of multiple factors across periods of development. Using this analytical approach and framework would then help planners to better understand on the factors influencing cultural differences across nations, variation of cultural values at the local level and distinctions between general core values and values concerning particular issues of management.

6 Formal institutions in relation to floodplain management of the case studies

This chapter explains and classifies floodplain management approaches that are presented as formal institutions in the two delta regions under study. 'Formal institutions' here refer to administrative structures of competent authorities and regulations, policies and plans for territorial and water management in relation to flooding issues. They are expressions of culture at the structural level. In the conceptual framework developed in this study, formal institutions are also part of the development conditions, which form conditions for decision-making and actions regarding floodplain management.

The analysis of formal institutions in the case studies here is based on the conceptual framework for characterising territorial and water management in the form of ideal types of resource management and social organisation. It is the same framework used for classifying cultural values and management practices in Chapter 5 and Chapter 7 (see Section 3.3.2 for further detail about the ideal types). This is in order to make the three elements comparable. The findings derived in this chapter are then used in Part III to investigate influences of formal institutions on the shaping of floodplain management practices and spatial development outcomes in the case studies.

6.1 Competent authorities in management of flood-related issues in the Rhine-Meuse delta region

Management of flood-related issues in the Netherlands is administered under a rather unique and complicated organisational format (Hajer and Zonneveld 2000). The fundamental management principle is based on the concept of 'decentralised unitary state'. It means that the management of water is decentralised whenever possible, and centralised when necessary (Hajer and Zonneveld 2000; Zonneveld 2010; Vink and van der Burg 2006). The unity is brought about by consensus building through coordination and negotiation between different actors across sectors and levels of management (Hajer and Zonneveld 2000; Hendriks and Buntsma 2009; Ostrom and Janssen 2004). Coordination and consensus tasks are delivered through spatially relevant policies, such as the 'Delta Programme' (Hajer and Zonneveld 2000; Woltjer

and Al 2007; Zonneveld 2010). The coordination concept through spatial policies was legitimised in the 1965 Spatial Planning Act (Hajer and Zonneveld 2000). Through coordination and negotiation processes, consistent approaches in management are enhanced.

Management of flood-related issues in the Dutch management context is integrated as part of the water management framework. The analysis is thus based on the analysis of competent authorities in water management, by emphasising aspects relevant to the management of flood-related issues in particular. Figure 36 shows the present administrative structure in water management in the Netherlands. This unique organisational format emphasises coordination throughout all planning and implementation processes. It is a result of the gradual adaptation of different traditions in social organisation by the authorities involved.

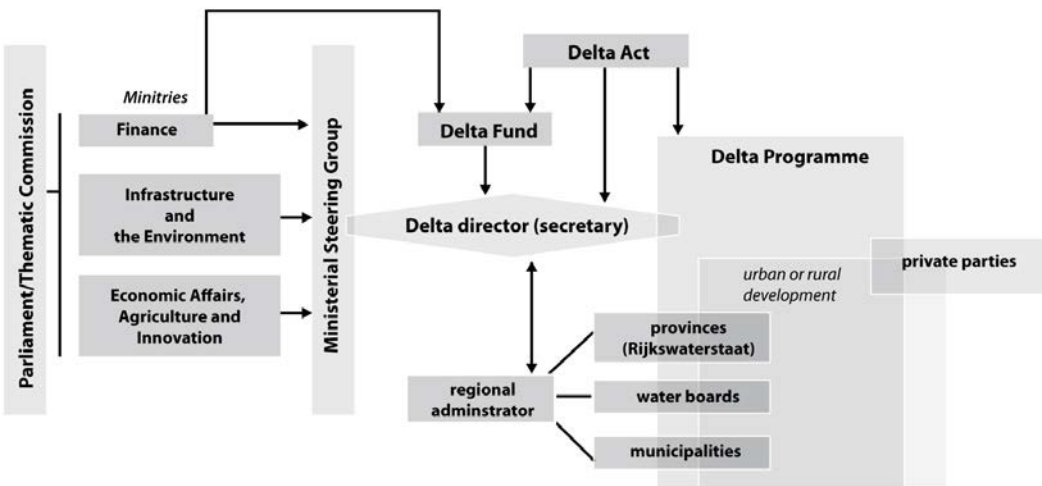

Figure 36
Administrative structure of water management in the Netherlands
Sources: Redrawn from an illustration in the full report on the new Dutch water management vision, namely 'Working together with water: A living land builds for its future' (Deltacommissie 2008, 83)

In the Dutch context, there are three major competent authorities in water management. They are water boards, the Rijkswaterstaat (Directorate General for Public Works and Water Management in English) and the Deltacommissie (Delta Commission in English). This section describes the evolution of the three major authorities along with their management approaches present in the organisational structure, as well as relevant policies and programmes issued by them at different times. Table 9 summarises the relevant information for the analysis of cultures in floodplain management by competent authorities in the Rhine-Meuse delta region.

Authorities	Establis. year	Level of organisation	Responsibilities/Objectives	Examples of measures
Water boards	1255	local/ regional	- Implementing programmes at the regional level - Operating and maintaining water infrastructure at the regional (and local) level	- dike ring, canal system
Rijkswaterstaat	1798	national/ provincial	- Developing management plans, frameworks and regulations - Implementing programmes at the provincial level - Supervising water boards	- dam, dike, storm surge barrier
Deltacommissie	1956/ 2007	national	- Developing national water policy and legislation	- legislation (e.g. Delta Act)

Table 9
The competent authorities in water management in the Rhine-Meuse delta region
Note: Information is summarised from several sources, including Hendriks and Buntsma (2009), van Leussen and Lulofs (2009), Zonneveld (2010) and Deltacommissie (2008)

6.1.1 Water board: a conventional collective-based type of social organisation

Water board was the first formalised form of administrative body competent in water management in the Netherlands. It was officially institutionalised for the first time in 1255 (Hooimeijer *et al.* 2005; Ostrom and Janssen 2004). Institutions functioning for water management at the local and the regional levels, however, existed before that time (van de Ven 2004). Water management in the region in that early period was based on an underlying rationale namely that '*Wie het water deert, die het water keert*' (Dicke 2001). This could be translated as 'those being affected by the risk of water are responsible for stopping the water'. The establishment of water boards was an attempt to maintain the integrity of more extensive and complex local water control structures, which had been built earlier and had been maintained by individuals who directly benefited from them (Hooimeijer *et al.* 2005; Ostrom and Janssen 2004).

Initially, the water boards were in charge of water management at the local level, in conjunction with their respective polder areas (van Leussen and Lulofs 2009). The boundary for which these local water authorities were competent may cover one or several municipalities in the same watershed. Later, their role has extended to water management at the regional level, by which the role at the local level has been maintained through cooperation with municipalities (van Leussen and Lulofs 2009). This change in the scale of responsibilities is especially apparent from the merging of around 2,500 water boards into 24 regional water boards over the past 60 years,

aiming to improve coordination with joint interests across larger territorial entities (Hendriks and Buntsma 2009; "Waterschappen" n.d.).

Regarding the management type of water boards in relation to social organisation aspects, it corresponds to a collective form of organisation with rather symmetrical transactions. The management model of water boards is based on collective tasks derived from consensus amongst individual interests, in which the fundamental principle of 'interest-pay-say' or 'pay to play' has been maintained (Zonneveld 2010; Hendriks and Buntsma 2009). In other words, it is a form of organisation that puts together the individualised and the collectivised principles of water management. The symmetrical transaction characteristics of water boards are present in the organisation structure, in which a significant number of the members in the general governing board and the executive committee are elected (Havekes *et al.* 2008; Lazaroms and Poos 2004). Yet, some members, including the chairperson, are appointed by the central government, which help ensures cooperation between the central and the local authorities (Havekes *et al.* 2008; Lazaroms and Poos 2004; Hendriks and Buntsma 2009).

The symmetrical transactions and management based on individual interests for collective tasks are also present in the financial model of the water boards. Currently, the main financial source for water boards is tax collection. The collection of taxes is proportionate to the amount of land occupancy by a tenant and the costs and benefits in relation to the use of water infrastructure (Havekes *et al.* 2008). This is different from the situation in the early period of water boards establishment, in which private contributions were the main revenue source over tax collection in most water boards (Dicke 2001). This shows slight changes of social organisation types, from the 'communal' type toward the currently more 'hierarchical' type of management. This change is argued in this study as being partly influenced by the centralised state and bureaucratic administration established during the period of the state formation in the region.

6.1.2 Rijkswaterstaat and Deltacommissie: increase of the degree of centralisation of formal institutions in water management

The changes in the role of the state in water management towards the 'hierarchical' type associated with more centralised authorities were observed. The first obvious attempt was the establishment of the Rijkswaterstaat in 1798, which was influenced by institutional changes brought by French rule (Hendriks and Buntsma 2009; Hooimeijer *et al.* 2005). The Rijkswaterstaat is the centralised form of water management authority, presently under the jurisdiction of the Ministry of Infrastructure and

Environment with appointed officials.[10] It is responsible for the design, construction, management and maintenance of highways and waterways. It functions as the implementing directorate for service delivery at the provincial level. It also ensures that the policies prepared at the national and the provincial levels are followed by the regional authorities and the local parties ("Rijkswaterstaat" n.d.; Hendriks and Buntsma 2009).

However, this imposed institutional change towards the centralised-hierarchical type of management was not accepted by the locals at first. Water boards remained the most competent authorities in water management until the disastrous 1953 flooding event, which affected the country to a broader scale than what water boards could withstand (Reinhard and Folmer 2009). This event brought about the realisation that the country needed a centralised authority and national policy for water management (Reinhard and Folmer 2009). The first Deltacommissie was then appointed in 1956. It was a temporary state commission consisting of experts from various disciplines, which aimed to provide advice to the Dutch Cabinet on measures to deal with future floods (Deltacommissie 2008). As a result of this appointment, the Delta laws were enacted in 1958. The laws were obligatory for all levels of authorities (Hooimeijer *et al.* 2005; Stive and Vrijling 2010).

The above evidence shows the increased role of the state with a centralised authority in water management. The increased role of the centralised authorities includes the evidence of the wider acceptance of the Rijkswaterstaat, with increased political and public supports for implementing the Delta Works (Reinhard and Folmer 2009). Yet, the strong role of water boards was still well maintained. The essential role of experts to direct visions for future policies at all levels of management shows the strong roles given to experts, which correspond to the 'hierarchical' type of social organisation. In short, current formal institutions regarding floodplain management in the Dutch context are based on collective management approaches in which the traditional symmetrical transaction type of management represented by the water boards is integrated with the asymmetrical transaction type of administration of the new institutions.

10 The Ministry of Infrastructure and Environment is a result of the ministerial rearrangement in 2010, which merged the Ministry of Transport, Public Works and Water Management with the Ministry of Housing, Spatial Planning and the Environment.

6.1.3 A new water management vision in the twenty-first century

Policy shift from 'fighting against water' towards 'working together with water'

Since the last few decades of the twentieth century, there have been trends of a policy shift regarding resource management in the Netherlands. This refers to the shift from the conventional Dutch approach of controlling nature towards a less controlling approach. As described earlier, water management approaches based on the principle of 'fighting against water' have been dominant in the Netherlands since the first formal institutions for water management (water boards) were established in the thirteenth century. Dike rings together with management of water levels in the system of canals have been employed to prevent settlements on low-lying areas from being damaged by floods. This 'fighting against water' management approach has remained apparent also through the large-scale water management projects, executed during the twentieth century. These include, for instance, the Zuiderzee Project executed in the first half of the century and the Delta Works that were built in accordance to the suggestions given by the first Deltacommissie in response to the disaster of the 1953 flood. The suggestions were made based on safety standards that took into account probability principles and economic values.

In the late 1960s, there were environmental movements concerned with negative impacts created by the strong 'controlling of nature' type of projects to the ecological systems of the region (*Water Management in the Netherlands* 2011). The ensuing debates led to the establishment of a steering committee for the environment and the Environmental Act of 1970. It also led to the revision of some parts of the Delta Works, such as the redesign of the Oosterschelde closure in 1976, aiming at ecological protection by allowing salt-water to naturally flow in during normal periods (Hooimeijer *et al.* 2005; Bijker 2002).

Yet, the impacts of this change were not as remarkable as the changes that are associated with the state appointment of the Deltacommissie for a second time in September 2007. At this time, the commission was appointed to advise on water management strategies to deal with the challenges in the current changing climatic and territorial development conditions (Deltacommissie 2008). In 2008, the Deltacommissie launched a new Delta Programme associated with a new management vision, namely 'working together with water'. This new vision is part of the national policy agreement for water management in the twenty-first century, known as '*WB21*' (Hendriks and Buntsma 2009). The policy agreement was embedded, financially, politically and administratively in a new Delta Act, which can be implemented through the use of spatial plans within the ambit of existing legislation under the present administrative structure as shown earlier in Figure 36. Figure 37 presents the summary of projects launched in response to extreme floods in the region since the twentieth century.

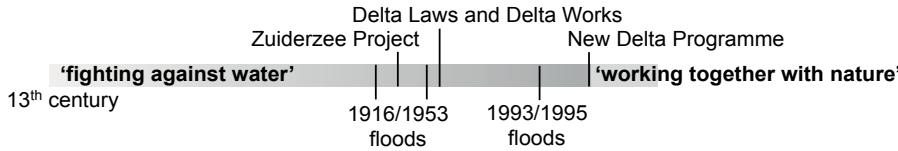

Figure 37
Flood mitigation projects executed in response to the extreme floods in the Rhine-Meuse delta region since the twentieth century

This new vision recommends protecting the Dutch coastal areas and the low-lying hinterland in the contexts of changing climatic conditions and diminished natural resilience based on principles of risk-based management (Deltacommissie 2008; Woltjer and Al 2007). This management vision is in line with the European Directives on the assessment and management of flood risks launched in 2007 (Directive 2007/60/EC 2007), which promotes the development of flood risk management plans using strategies based on multi-layer of water safety. This multi-layer approach refers to flood risk management plan that integrates flood prevention, protection and preparedness measures ("A New EU Floods Directive" n.d.; Hoss *et al.* 2011). Prevention measures include structural measures, such as dikes, dams, storm surge barriers and levee setbacks, which help reducing probability of flood. Protection measures include, for instance, zoning regulations, building codes and flood proofing, which aim at mitigating flood damages. Preparedness measures aim at crisis management, including evacuation, emergency response and recovery during and after flooding.

The new Delta Programme shows an attempt to cooperate more with water, rather than to keep solely practicing the conventional 'fighting against water' approaches. This change in the resource management approach is expressed also in the 'Room for the River' programme, which is part of the new Delta Programme. One of the fundamental management principles of the programme is the concept of 'retain-store-discharge', which means offensive hard measures are to be employed only when necessary (Hendriks and Buntsma 2009). The programme includes several soft measures (such as 'depoldering'), which suggest relocating dikes more inwards into the land in order to provide more room for the fluvial water during extreme floods (Hendriks and Buntsma 2009; Planning Key Decision 2006; Woltjer and Al 2007). Apart from being more integrated with nature, this reoriented management approach also corresponds to the management principle with a lower degree of uncertainty avoidance than the previous approach, as the new approach occasionally allows low-impact inundations in some areas according to the state's flood risk management plan (Deltacommissie 2008).

Despite evidence of the inclusion of less 'controlling of nature' measures, the persistence of the management principle of 'controlling of nature' remains considerably apparent in the new vision and in the set of management measures in the 'Room for the River' programme. The persistence of a high degree of uncertainty avoidance is clearly stated in the basic premises of the 'working together with water' policy document, namely that '*[f]lood prevention for safety is crucial for the entire country… [t]he Committee has chosen to adopt the previous Delta Committee's risk-based approach*' (Deltacommissie 2008, 41).[11] This persistence is present also in the objectives of the 'Room for the River' programme that put safety as the highest priority (Planning Key Decision 2006). The presence of an anthropocentric approach to management is evident in the package of measures, of which several measures emphasise the control and manipulation of water rather than the adaptation of human behaviours ("Room for the River" n.d.). In this study, these changes are argued as being instrumental changes aiming to improve the effectiveness of conventional management approaches, rather than as changes in water management traditions. This is supported by a report prepared by the Deltacommissie (2008), stating that changes of management approaches in water management policies are concerned as experts realised how changing climatic conditions would make the cost of maintaining flood prevention structures according the previously defined standards extremely high.

Increase of individual-based social organisation in water management policy

As previously mentioned, the Directive 2007/60/EC promotes the development of flood risk management plans using strategies based on a multi-layer approach to water safety. Enhancing implementation processes based on protection and preparedness measures implies a lower degree of control of the state than the conventional prevention-based management approach does. It calls for individuals to collaborate more with the state and actively contribute to management to a higher extent than before. The call for individual contributions is addressed clearly in one of the basic premises of the new management policy and programmes, namely that '*[w]ater safety is a collective, national responsibility: everybody, no matter where they live, has an interest in water safety and therefore contributes financially to it*' (Deltacommissie 2008, 41). Yet, the statement also expresses the continuation of the Dutch collective-based social organisation tradition as present in policies in the past.

11 The acceptable risk for complete failure was set according to the potential hazard and vulnerability to flooding in each area. A higher acceptable risk was set for areas potentially affected by riverine floods (ranging from 1 in 250 to 1 in 1,250 years) than those affected by sea floods (ranging from 1 in 2,000 to 1 in 10,000 years). This was due to potentially lower amounts of damage and the longer warning time created by river overflows than storm surges (Stive and Vrijling 2010; van Leussen and Lulofs 2009).

The collective-based water management activities are legally binding under the Delta Act, as shown earlier in Figure 36. Regarding the reduced responsibility of the state, there have been great attention and debates whether this shift would be accepted in practice by the society. Research projects and surveys (such as Botzena *et al.* 2009 and Terpstra 2010) have been carried out to support the policy-making and implementation under this new management vision. The above observations show a tendency of shifts in management policy, yet still with the persistence of traditions in water management. This tendency is not limited only to resource management. Likewise, the Dutch social organisation tradition has been also well maintained and aware of in the new Dutch water management policy and programmes.

6.1.4 Summary of formal institutions regarding floodplain management in the Rhine-Meuse delta region

In short, the evolution of administrative structures and policies in the management of flood-related issues in the region shows that the conventional management approaches, both in social organisation and resource management, have been rather well maintained over time. Despite the predominance of the traditional 'controlling of nature' type, recent attempts to incorporate more of nature and uncertain situations were observed. This change is partly affected by transfers of ideas and policies driven by Europeanisation through EU directives. However, the new approach does not replace existing traditions, but is integrated into the conventional management approach, as presented in Figure 38.

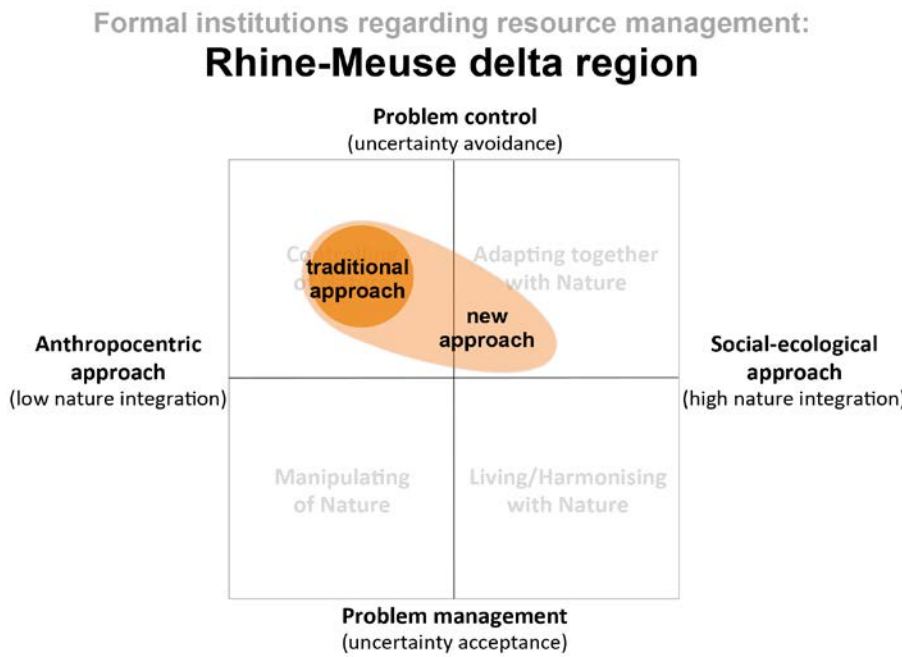

Figure 38
Evolution of resource management approaches in management of flood-related issues presented in formal institutions in the Rhine-Meuse delta region

Regarding the social organisation approach, the institutional transformation over centuries has resulted in a unique format of water management administrative structure, in which the 'individualistic', the 'communal' and the 'hierarchical' types of management are integrated. The process transformation over the centuries is presented in Figure 39. This integrated type of management works through cooperation between authorities across different scales of operation.[12] This cooperation supports the delivery of collective tasks under the common premise of minimising possible damages caused by flooding in the settlements. However, it should be noted that there have been attempts to increase individuals' role in mitigating flood damages. This change is also part of the transfers of ideas and policies through EU directives.

12 The scale has expanded over time from the management executed by individuals to small communities, regions, the state and the international management. The extension of the scope of water management across nations is linked to the requirement for management of river basin districts as suggested in the European Water Framework (Hendriks and Buntsma 2009). Despite an extension to cover a broader scale of flood management over time, decentralisation in management of flood-related issues at all scales has been well maintained and even strengthen recently. This is shown in the *WB21*, which puts forward that issues should be addressed at the level where they appear, either at the individual, municipal or provincial levels, and not relying solely on the protection provided by the national government (Bockarjova *et al*. 2009).

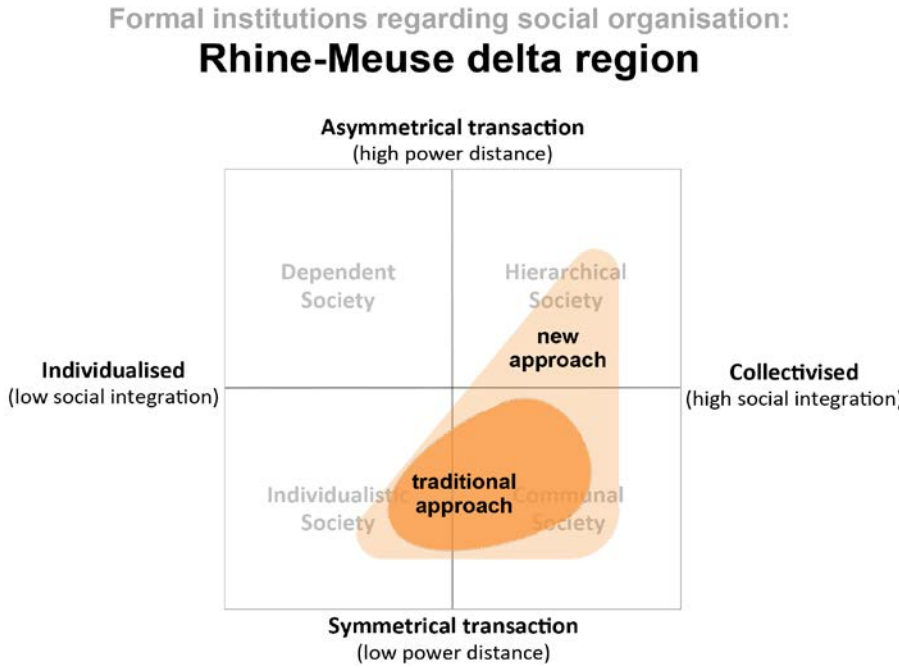

Figure 39
Evolution of social organisation approaches in the management of flood-related issues present in formal institutions in the Rhine-Meuse delta region

6.2 Competent authorities in management of flood-related issues in the Chaophraya delta region

In the Thai management context, there had not been any competent formal institutions in the management of flood-related issues particularly until the twentieth century. Formalised forms of water management in the Chaophraya delta region began only in 1902, when the Canal Department (the present Royal Irrigation Department – RID) - was established. It was the first official authority for water management in the country. Before that, the state had been responsible for excavating principal waterways mainly for transportation purposes. Extension of water networks from principal waterways as well as other issues of water management were often undertaken by communities or individual households (Tanabe 1977, cited in Askew 2000). Yet, the first objective of the early water management institutions in Thailand (the RID) was to distribute water for agriculture, especially during dry seasons. This was different from the objectives pursued by Dutch water management authorities, in which

regulating water to prevent settlements from suffering flood damage is one of the main objectives.

In the Thai case, water management in relation to flood-related issues for urban areas began only after the 1983 flood. The 1983 flood resulted in the region being vastly inundated for four months (BMA n.d.). Since then, water management regarding flood-related issues has received more attention from policymakers. However, the management carried out by the public sector was based on fragmented sector-based projects. There was no legitimised agency being specifically competent in water management regarding flood-related issues until recently, when the administrative structure for water management was reformed. This present administrative structure as the result of the reform in 2012 is shown in Figure 40.

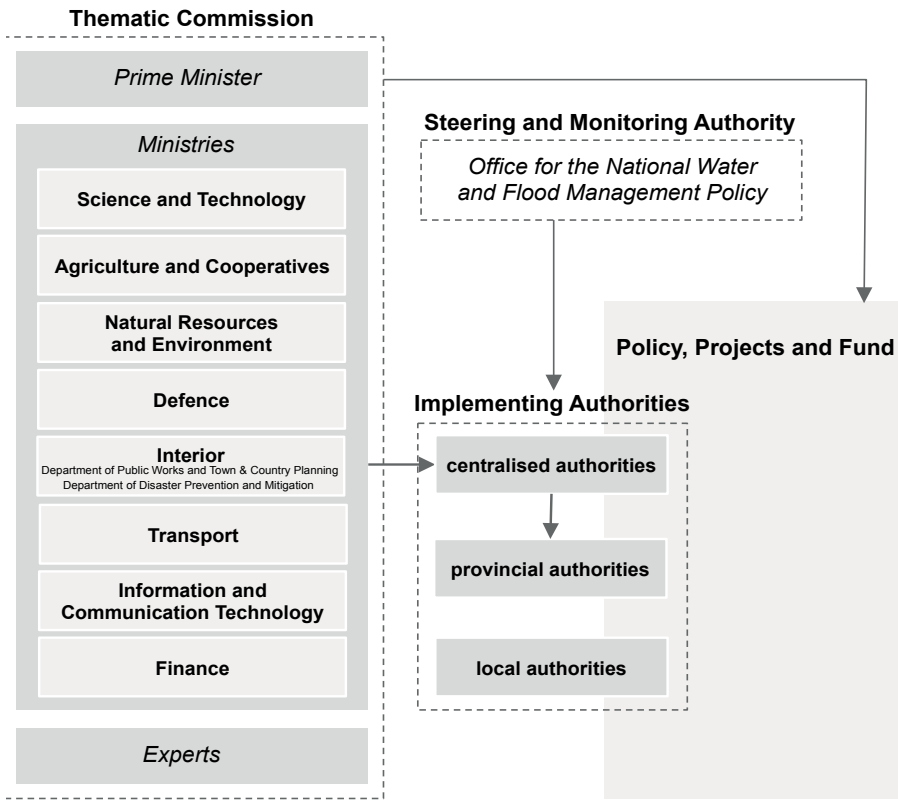

Figure 40
Administrative structure of water management in Thailand
Sources: Adapted from information provided by the Office of the National Water and Flood Management Policy ("Office of the National Water" n.d.)

The present administrative structure is significantly influenced by the Dutch water management model, as a result of the appointment of Dutch consultants by the Thai government during the 2011 flooding event (Verwey 2012). Nevertheless, the two models remain fairly different, underpinned by distinctive political settings and traditions in territorial and water management. In order to understand the underlying principles of the Thai model, it is necessary to look at the evolution of the competent authorities in water management along with the relevant projects being implemented in the region. The most competent authorities in making and implementing water management policies and projects in relation to flood-related issues in the Chaophraya delta region can be divided into four groups. These agencies employ different resource management approaches, in accordance to their main responsibilities and objectives. Table 10 summarises the relevant information about these authorities.

(i) The Royal Irrigation Department (RID) is the competent authority for water management at the national level under the Ministry of Agriculture and Cooperatives.
(ii) The Department of Drainage and Sewerage (DDS) and the Department of Public Works under the Bangkok Metropolitan Administration (BMA) and the Public Works Department (PWD) in the municipalities are in charge of maintaining water infrastructure and constructing public infrastructure at the local level.
(iii) The City Planning Department (CPD) under the BMA and the Department/ Section of Public Works and Town & Country Planning (DPT)[13] in the provincial government and the municipal-level authorities are in charge of spatial planning.
(iv) The Office of the National Water and Flood Management Policy is a steering and monitoring agency, being responsible for ensuring the consistency of policy implementation across all levels.

13 DPT is the result of an administrative reform in 2002 that merged two departments into one. It was a merger of the Department of Public Works, established in 1889 and the Department of Town & Country Planning, established in 1962. These merged departments are now part of the provincial government and the municipalities. However, the two departments in the BMA remain separated, under the names as City Planning Department and Department of Public Works..

Authorities	Establis. year	Level of organisation	Responsibilities/Objectives	Examples of measures
Royal Irrigation Department (RID)	1902	national	- Regulating water distribution at the national level	- dams, reservoirs and irrigation canals
Department of Drainage and Sewerage (DDS) and Public Works Department (PWD) in municipalities	1972	local	- Developing management plans and regulations - Implementing programmes at the local level - Operating and maintaining water infrastructure at the local level	- dikes, canal systems, flood tunnels, polder systems, temporary installation of flood barriers and pumps
City Planning Department (CPD) and Department of Public Works and Town & Country Planning (DPT)	1961/ 1881-1962	local/ provincial	- Developing land use plan and regulations - Regulating land uses	- land use plans and regulations
Office of the National Water and Flood Management Policy	2012	national (policy level)	- Developing action plans - Steering and monitoring implementation at all levels	- fund for proposals under the defined policy framework

Table 10
The competent authorities in management of flood-related issues in the Chaophraya delta region
Note: Information is summarised from several sources, including Hungspreug, Khoa-uppatum and Thanopanuwat (2000), Vitoonpanyakij (2007), UNESCO (2006), DDS (2011), CPD (n.d.), DPT (2008) and the Office of the National Water and Flood Management Policy ("Office of the National Water" n.d.).

6.2.1 Dominance of a centralised-hierarchical type of social organisation

The traditional territorial and water management in the Chaophraya delta region was based on an area-based management approach with a low degree of power distance (Shigetomi 2003). This management approach refers to a system in which the extension of water networks from the principal waterways into communities and other water management issues were undertaken by communities ('communal type') or individual households ('individualistic' type). The traditional area-based management approach was replaced by a centralised sector-based management approach soon after the period of administrative modernisation in the nineteenth century. At present, most of the recent water management projects are planned by experts and executed by the centralised sector-based institutions. The dominant role of the centralised authorities is apparent, despite the presence of local authorities in the list of competent authorities in water management of the Chaophraya delta region shown in the newly reformed administrative structure (see Figure 40). It presents the strong dominance of the 'hierarchical' type of social organisation in the formal institutions being applied in the region.

Evidence of the strong dominance of the centralised-hierarchical type of social organisation is the major role of the RID to regulate water distribution, with the local authorities being responsible for flood mitigation through manipulation of excessive water. In other words, the RID decides whether and how much water needs to be released from the upstream dams. The RID is in charge of preparing a flood mitigation plan at the level of river basins. This includes, for instance, the integrated plan for flood mitigation in the Chaophraya river basin in 1996 and 1999 (Hungspreug *et al.* 2000). As the water arrives in the territory, local authorities (i.e. the BMA and the other municipal-level authorities) are responsible in managing it to minimise flood damage.

The dominant role of the centralised authorities also remains apparent in the newly reformed administrative structure. This is clearly presented in the form of a strong connection between the thematic commission and the implementing authorities based on the ministerial system, in which local authorities are supposed to follow top-down policy (as shown in Figure 40). This is because provincial governments are the part of the central government that is responsible for territorial management at the provincial level, to which the governor is appointed and the departmental officials are under command of the national ministries (State's Administration Regulations Act 1991 1991). Nevertheless, the role of local planning agencies in water management through the use of land use regulations has recently increased since the legitimisation of the Land Use Ordinance through modifications of the City Planning Act in 1992 (DTCP 1992). Since then, land use plans, which were previously taken only as guidelines for development without legal enforcement, became legally binding.

This centralised-hierarchical type of management in the Thai context is, however, associated with a specific characteristic. Despite the strong role of the bureaucratic institutions in executing water management, many water management plans and projects were not prepared by experts within the responsible authorities. These plans and projects were either the selection of projects suggested by studies that were prepared by consulting agencies (mostly by foreign experts) or projects developed according to the King Rama IX's ideas (the current King of Thailand). Examples of the studies prepared by consulting agencies are several plans in the 1980s for flood protection of the Chaophraya river basin (BMA 1986) and the urgent call for aid from Dutch experts to cope with the 2011 flood (Verwey 2012). Examples of projects that were initiated based on the King's ideas are '*Kam-ling*' projects and the recent projects related to the 'floodway' principle (see Section 6.2.3 for the details of these projects). The influences of King Rama IX's ideas on policy-making present the significant role of informal institutions in the shaping of formal institutions within the Thai context. However, it should be emphasised here that this study refers to the influence of the King as presenting the significant role of informal institutions in floodplain management in the Thai context, not formal royal prerogatives. The issue of the significant role of informal institutions is elaborated further in the subsequent chapters.

6.2.2 Emergence of a 'controlling of nature' type of policy and a 'manipulating of nature' type of action

Before the country's modernisation and the enactment of new land policies at the turn of the twentieth century, the state employed a traditional floodplain management approach, which was based on the 'living with nature' type of resource management. The state used canalisation as the instrument for promoting land development. During that period, canalisation was carried out only to the areas associated with a low degree of flood proclivity; natural floodway and swampy areas (such as Khlongluang - a case study area for the sub-national comparison) were left unoccupied (Jarupongsakul and Kaida 2000).

After the establishment of the RID (the first official authority established especially for water management) in 1902, this traditional 'living with nature' type of management vanished and the modernised 'controlling of nature' type of policy became more predominant. The initial task of the RID was to manage water mainly for irrigation purposes. The main measures employed by the RID were the construction of dams, reservoirs and dikes along the rivers, aiming mainly to ensure sufficient water during drought periods and minimise flood damage to the settlements downstream (Hungspreug *et al*. 2000). This 'controlling of nature' type of management at the national level employed by the RID was complemented by the construction of dikes and embankments along the rivers at the municipal level by the PWD (Hungspreug *et al*. 2000).

This 'controlling of nature' type of measures appeared helpful in mitigating flood damages caused by overbank flows to a certain degree. Nevertheless, the region has still experienced occasional floods caused by overbank flows in years with extreme floods, and regular inundations caused by local intense rainfalls (Hungspreug *et al*. 2000). In these cases, it is the responsibility of the DDS to manage excessive water in order to minimise possible damages to the urban areas. The main measures employed by the DDS, such as the uses of flood tunnels and canal networks along with water gates and pumps, are based on the 'controlling of nature' type of management (DDS 2011). In addition to that, the temporary installation of sand bags and water pumps has been often employed, as the planned systems were not efficient enough in coping with the excess water. In short, the management approaches employed by the above three competent authorities in management of flood-related issues are rather common. They are based on the 'anthropocentric' approach to resource management. Yet, they are slightly different regarding their degrees of uncertainty avoidance.

6.2.3 Return to retro: from 'fighting against water' towards 'working together with water'

The 'fighting against water' (i.e. anthropocentric) type of policies and projects had been predominant in the management of flood-related issues employed by formal institutions in the Chaophraya delta region since the turn of the twentieth century. After the extreme flooding events, the competent management authorities launched new projects, aiming to mitigate problems resulting from floods, as summarised in Figure 41. The projects executed after the floods of 1942 and 1983 corresponded to the 'controlling of nature' type of resource management, associated with an anthropocentric approach (low degree of nature integration) and a high degree of uncertainty avoidance. However, there have been recent movements towards reshaping management approaches in response to the extreme floods of 1995 and 2011. These changing approaches give more attention to nature integration in resource management. These changing approaches refer to management based on the principle of 'working together with nature', rather than emphasising only the strong control of water.

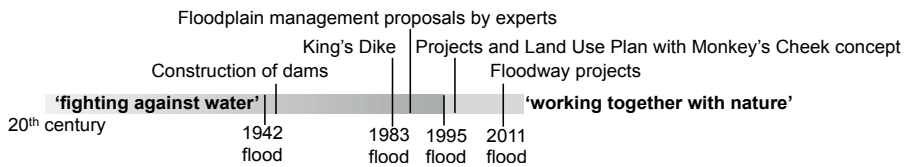

Figure 41
Flood mitigation projects executed in response to extreme flooding in the Chaophraya delta region since the twentieth century

All the projects above, except the proposals for floodplain management prepared by experts in the 1980s, were based on ideas initiated by King Rama IX's speeches. The most notable ones that led to the projects based on the principle of 'working together with nature' were the public speech and the suggestions given in the special meeting with the authorities in competent for water management in 1995. In the King's public speech, the King presented the concept of temporary storage of water in some places at high tide and draining it out at low tide, to which he named as '*Kam-ling*' [translation: Monkey's cheek, referring to the idea of the water detention area] (Hungspreug *et al.* 2000). In a special meeting in 1995, the King stated the importance of preserving low-lying areas in the Chaophraya river basin to function as 'floodway', in order to improve flood mitigation for the whole region (Reumvieng 2011). Based on King Rama IX's ideas, several projects were developed and implemented in the following years by

the competent authorities. This reveals a strong role of King Rama IX as an informal institution shaping formal institutions in the Thai context, as mentioned previously.

An example of policies related to the reoriented management approach towards 'working together with water' was the introduction of the 'rural and agricultural conservation' land use type in the 1999 Bangkok Land Use Plan and the Strategic Development Plan for 2057, which were prepared by the CPD and the DPT respectively (CPD n.d.; DPT 2008). The introduction of this land use type along with the regulations for rural and agricultural conservation shows an attempt to regulate land uses in potential areas to function as water detention areas and natural floodway, corresponding with the 'adapting together with nature' and the 'living with nature' types of water management (Tapananont and Noppan 2011). Another example of the projects associated with this reoriented management approach was the conversion of the coastal areas on the east and the west of the Chaophraya River into flood detention areas ('*Kam-ling*' projects in Thai), which were executed by the BMA and the RID (Hungspreug *et al.* 2000).

The 'floodway' principle has received great attention by the state after the catastrophic flood in 2011. This is evident from the call for water management proposals based on 'floodway' concept under the great amount of special fund for floodway-related projects, which was approved by the Commission for National Water and Flood Management Policy. However, great variations amongst different sectors in the interpretation of the 'floodway' principle were observed. For instance, the DPT incorporated the 'floodway' principle through land use regulations based on the 'adapting together with nature' management approach. This management approach is remarkably different from the TOR of the '2012 Plan for Sustainable Water Resource Management and Flood Mitigation' that called for tender for 'floodway' construction. This plan of floodway calls for construction of large-scale water channels in the natural floodway ("Flood Mitigation Projects" 2012), which corresponds with the 'controlling of nature' type of management approach. These proposals show great variations in the Thai formal institutional context regarding traditions in management of territory and resources that have been embedded in different sectors.

6.2.4 Variation of land policies during the reclamation period of three districts in the Chaophraya delta region

Land policies applied to the beginning period of land development in the three districts were distinctive. The land policy applied for reclamation in Khlongluang corresponded to the different management approach than the traditional land policy that applied to the other two districts. In Bangkoknoi-Talingchan and Bangkhuntien, the early settlements were built based on the traditional 'occupancy-by-use' land tenure system (Chitchang 2006). Land reclamation through canalisation in Khlongluang was induced by the privatisation policy for land development under the modernised 'title deeds' land tenure system. This privatisation policy granted ownership of unoccupied land on both sides of the canals to the concessionaires who executed and were responsible for all the cost of the canalisation (Molle 2005). Although both policies imply a low degree of power distance in territorial management, their implications regarding resource management approach are distinctive. The 'occupancy-by-use' land tenure system implies a higher degree of nature integration than the privatisation policy under the 'title deeds' land tenure system. This is because households would occupy the land only if it is suitable for development and cultivation. Private developers would thus choose to manipulate or control water in order to reclaim unoccupied land, which were mainly swampy areas.

The differences above of the formal institutions is argued in this study as resulting in distinctive practices in territorial and water management across the three selected districts for analysis. This is further investigated in Part III.

6.2.5 Summary of formal institutions regarding floodplain management in the Chaophraya delta region

Figure 42 and Figure 43 summarise the evolution of floodplain management approaches in the formal institutions in the Chaophraya delta region. They present the evolution of management regarding aspects of resource management and social organisation respectively. It was observed that the measures employed by competent authorities during previous flooding events correspond to the 'controlling of nature' type and the 'manipulating of nature' type. Yet, the great damages caused by the breaking down of the flood prevention systems in 2011 has brought substantial attention to government to integrate the previous 'anthropocentric' (fighting against water) management approaches with the 'social-ecological' approach by incorporating more of nature in territorial and water management policies.

Regarding the social organisation approach, the new water management administrative structure in the Chaophraya delta region shows strong expressions of the centralised (sector-based) 'hierarchical' type of social organisation. This is considerably different from the traditions corresponding to the decentralised (area-based) system employed by the state before the introduction of the modernised administrative and legislative structures in the nineteenth century. This centralised-hierarchical type of management under a bureaucratic system is associated with a unique characteristic. Namely, policy-making was carried out by local experts along with the strong influences of transferred knowledge and policies as well as the influences of informal institutions.

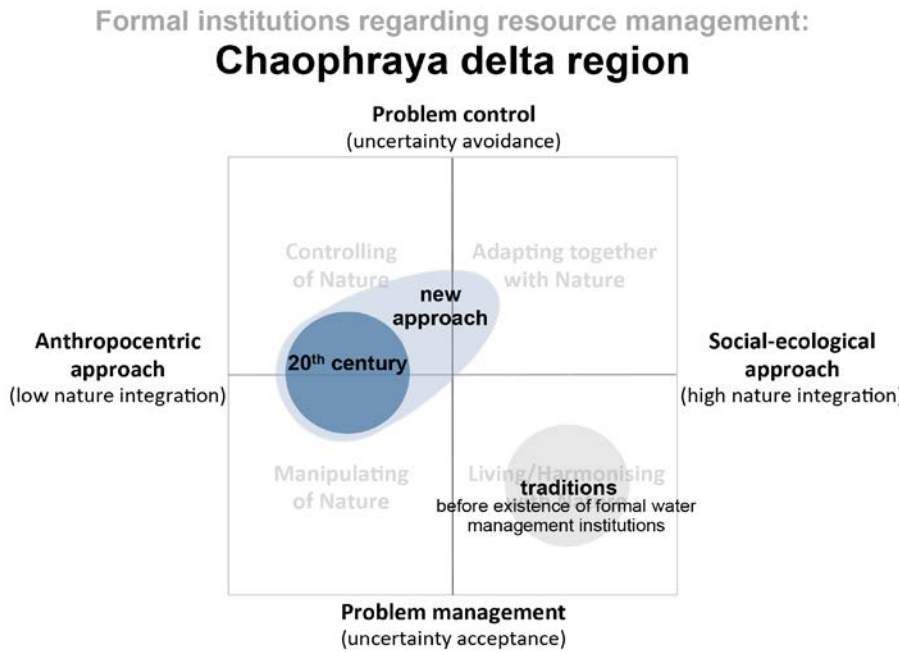

Figure 42
Evolution of resource management approaches in management of flood-related issues present in formal institutions in the Chaophraya delta region

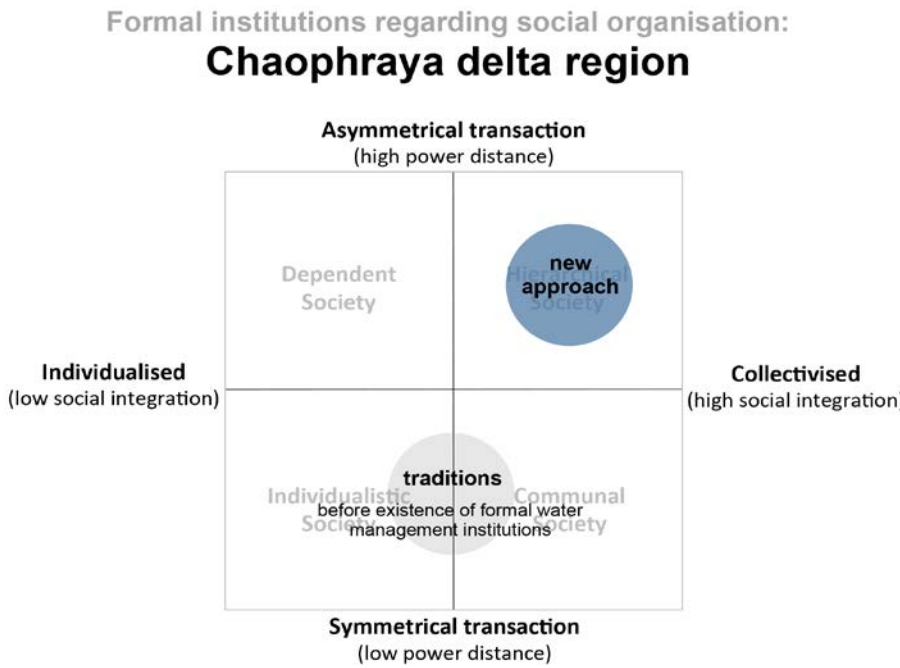

Figure 43
Evolution of social organisation approaches in management of flood-related issues present in formal institutions in the Chaophraya delta region

6.3 Comparison of formal institutions regarding floodplain management in the case studies

The analysis carried out in this chapter reveals that the traditional floodplain management approaches present in formal institutions in the two delta regions were remarkably distinctive. The 'controlling of nature' type (with a high degree of uncertainty avoidance and a low degree of nature integration) was predominant in the Dutch case, whereas the 'living with nature' type (with a low degree of uncertainty avoidance and a high degree of nature integration) was predominant in the Thai case. Regarding social organisation aspects, the Dutch formal institutions were based on a symmetrical transaction with a collective-based management approach, in which individual interests were incorporated. The Thai formal institutions were also based on symmetrical transactions with minimal involvement of the public sector; but the collective-based management approach was absent.

However, the institutions in these regions have evolved and seem to have been adapting towards more common approaches over time. In the twentieth century, the predominant organisations and policies in management of flood-related issues in the two regions shared two common characteristics. These two characteristics refer to the 'anthropocentric' approach in resource management and the 'hierarchical' type in social organisation. These seemingly common institutions involved, however, various distinctive aspects, especially regarding their unique characteristics of the 'hierarchical' type of social organisation and the evolution of these institutions. The rational management in the service of a clearly-defined public interest informed by the best available expertise in the Dutch formal institutions incorporates the individual interests through 'democratic pragmatism' processes to get consensus amongst actors concerned with the problem issue. It means that the 'hierarchical', the 'individualistic' and the 'communal' types of social organisation are integrated in one management model. In the Thai case, the 'hierarchical' type of management is operated under a bureaucratic system mainly under the central government's control, with strong influences of informal institutions and transferred knowledge and policies from abroad.

Regarding the processes of evolution in the two cases, they were underpinned by great differences. Institutional transformation of Dutch institutions has been driven mainly by endogenous change-initiating factors, such as how the realisation for the need to change was caused by local flood events. This resulted in the adaptation of existing institutions, in which traditions were kept and integrated with new requirements or ideas. On the contrary, institutional changes in the Thai case have been driven significantly by exogenous change-initiating factors. The Thai modernised form of formal institutions is the result of imposition of institutions, policies and knowledge being transferred or borrowed from other countries with fundamentally different world views. In addition, although both of the case studies have involved in the processes of policy transfer, their experiences are rather different. In the Thai case, it is the transfer of organisation structures and policies without awareness of local preconditions including possible cultural conflicts. In the Dutch case, this awareness has been addressed and taken into consideration in the processes of policy making and implementation.

At present, the administrative structures and policies of the two cases seem rather similar. The policies are based on the principle of 'working together with water', which promotes management approaches that integrate more with nature. Cooperation across levels of management with mechanisms to ensure consensus and coherence in policy implementation is enhanced. This is supported by legislative and budget frameworks stipulated by the central government. However, the analysis above shows that the ways these seemingly similar administrative structures and policies are understood and operated in the two regions are different. The different and similar management types of formal institutions of the two case studies are then compared in the subsequent chapters with the type of management cultures interpreted in Chapter

5 and management outcomes analysed in Chapter 7. This is in order to further explore their relationships and effects in planning practice in Part III and to conclude on the implications for spatial planning and public policy analysis in Part IV.

7 Planning practices and spatial development patterns of the case studies

According to the proposed conceptual framework, territorial management outcomes are significantly influenced by culture and its interrelationships with other development conditions (e.g. physical and social attributes as well as formal institutions). The term 'territorial management outcomes' in this study refers to both planning practices and spatial development outcomes. This chapter analyses management types present in the instruments, measures and procedures taken to cope with flooding and the spatial development patterns in the two delta regions under study. The management types are classified using the same conceptual framework developed in this study to characterise territorial management in the specific context of floodplain management in the form of ideal types used in Chapter 5 and Chapter 6 (see details of the framework in Section 3.3.2). The territorial management outcomes are classified in the form of ideal types in order to make them comparable with the analysis of the other elements studied, i.e. cultures and planning policies.

This chapter also investigates whether the management types of these management outcomes have changed over time. The analysis is carried out at two levels of comparison. The cross-national comparison examines whether territorial management are practised differently in the two delta regions under study. The sub-national comparison investigates whether there is a variation of practices at the local scale (i.e. the scale of district in this case), of which common institutional frameworks are assumed.

The comparable ideal types present in the forms of culture, planning policy and territorial management outcomes in the case studies are used in Part III to explore whether they are correlated and whether changes of one element affect the other elements. The findings from such explorations would then contribute to a better understanding on the significance of culture in planning practice. The findings from the two levels of analysis helps develop an understanding of whether territorial management processes at different levels of development are affected by similar factors in relation to culture.

7.1 Planning practices and spatial development patterns in the Rhine-Meuse delta region

There were two major milestones for significant changes in floodplain management practised in the Rhine-Meuse delta region. The first milestone was the establishment of water boards - the first formal institutions competent in Dutch water management - in the thirteenth century. The second change was marked by the extreme floods of 1916 and 1953, which resulted in significant changes in formal and informal institutions in floodplain management in the Netherlands. Effects of these changes on management outcomes in the Rhine-Meuse delta region are elaborated below.

7.1.1 Planning practices and spatial development patterns from the thirteenth to eighteenth century

Settlements in the Rhine-Meuse delta region before the thirteenth century were concentrated on naturally high grounds along riverbanks or on *terpen* (artificial dwelling mounds in Dutch), which provided safe dry ground during high tides and river floods (Meyer 2010; Stive and Vrijling 2010). Densely agglomeration of settlements for non-agricultural activities (which is called hereafter as 'urban settlements') in the region was not widely apparent across the region until the thirteenth century (Borger 1998). The urbanisation processes on land associated with a high degree of flood exposure and hazard were made possible by the development of drainage and dike construction technology (Meyer 2010). Many *terpen* were then demolished for agricultural purposes. These changes since the thirteenth century represented an adaptation of the 'adapting together with nature' type of floodplain management towards the 'controlling of nature' type.

Since then, the 'controlling of nature' approach has been strengthened over time, driven by technological development in response to challenges posed by changes of natural environments, which were partly induced by human's exploitation of the land, such as reclamation of peat land and peat mining (van Dam 2002). The strengthening process to control water was carried out through the construction of windmills (which started in the fifteenth century and widely and rapidly spreaded in the sixteenth century) along with the improvement of canal systems, the use of steam engines for water drainage (which began around the end of the eighteenth century) and the regulation of the river flows (since the eighteenth century). The employment of these water management measures significantly decreased the effects of floods in urban areas, which were caused by storm surges and river overflows (Stive and Vrijling 2010). The improvement of flood protection systems was also possible because of the

economic development of the region brought on by trading and shipping industries during the Dutch Golden Age in the seventeenth century (Stive and Vrijling 2010). As a result of these all factors, flood protection systems were better managed and maintained; and new land reclamation efforts and urbanisation in areas that were naturally highly prone to floods had vastly extended (Meyer 2010; Stive and Vrijling 2010).

During this period, changes in aspects of the social organisation of floodplain management practised in the Rhine-Meuse delta region also took place. The construction and maintenance of drainage systems before the thirteenth century was based on the 'individualistic' type of social organisation under the fundamental principle that people being affected by the risk of water were responsible for stopping floods (Dicke 2001). The establishment of water boards in the thirteenth century changed the individualistic management principles and practices of water management towards a more community-oriented approach. Although landowners were still liable for the maintenance of drainage canals and dikes on their land (Stive and Vrijling 2010), a competent committee was authorised to make decisions concerning the management and inspection of water facilities, in order to enhance efficiency based on collective objectives and benefits.

In short, the analysis above reveals the predominance of the 'controlling of nature' type in resource management and the 'communal' type of social organisation in which individual interests were incorporated in floodplain management practised in the early period of urbanisation in the Rhine-Meuse delta region.

7.1.2 Spatial development patterns since the twentieth century

Generally, the traditional types of management approaches practised since the thirteenth century in the region have been maintained during the twentieth century. The continuation of traditional management approaches is associated with three major points that are significant for this study, as elaborated below.

(I) Continuation of the 'controlling of nature' type of management

In general, the predominance of the traditional 'controlling of nature' type of resource management practised in the region since the thirteenth century remained unchanged during the twentieth century. Evidence of practices based on the 'controlling of nature' type of management was the choice of development locations and the water management measures employed in new development projects. Figure 44 presents the evolution of urban settlements in the Rhine-Meuse delta region in the twentieth

century. The map shows that more than half of the country is located in the areas where flood exposure is naturally high. It also shows that expansion of urban areas into the naturally flood-prone areas has accelerated, especially during the latter half of the century. The extension of urban areas was driven significantly by technological development and the improvement of flood defences (Stive and Vrijling 2010). After the extreme flood damages caused by storm surges in 1916 and 1953, mega-scale water management projects were executed. These include, for instance, the Zuiderzee Project and Delta Works.

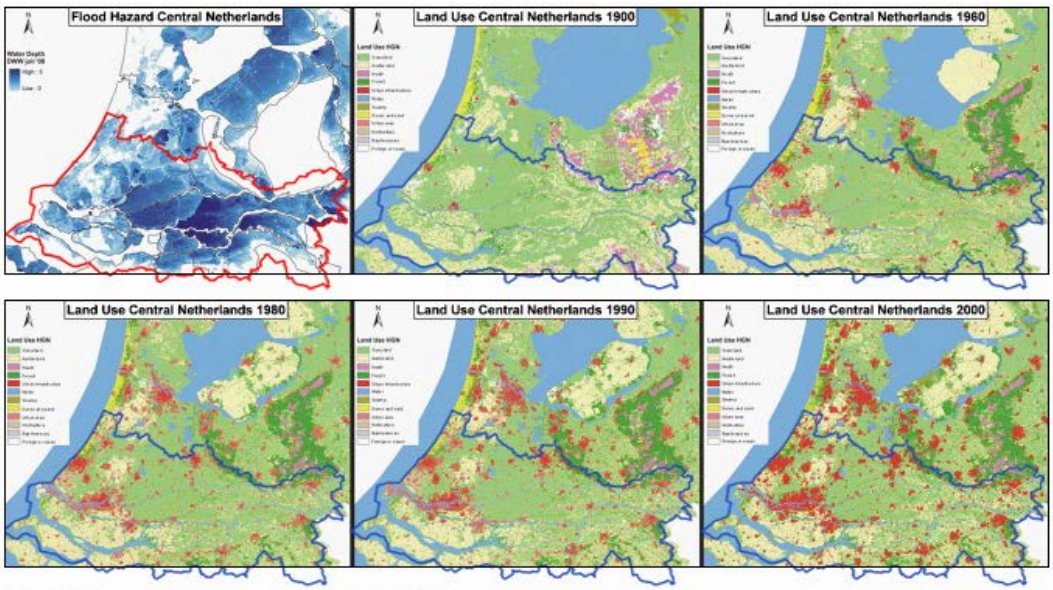

Figure 44
Flood-prone areas and evolution of urban expansion in the Rhine-Meuse delta in the twentieth century
Sources: de Moel et al. (2011)

These projects were based mainly on advanced hydraulic engineering solutions to control water, including the construction of dams, sluices, locks, dikes, levees and storm surge barriers (Stive and Vrijling 2010). These projects significantly reduced the degree of flood exposure of these naturally flood-prone areas. Since 1953, the region has not experienced any extreme flood damage. Increases in urbanisation in these well-protected areas rapidly accelerated, as shown in Figure 44. Statistical data of 2001 shows that the highest number of granted building permits were in provinces that are naturally more prone, but are well protected by high-standard flood defences (such as Zuid-Holland, Noord-Holland and Noord Brabant), with a relatively low number in the less protected provinces that are naturally less prone to floods (CBS 2002). This means uncertainty avoidance here was based mainly on man-made

flood preventive measures, rather than on location choices or on the adaptation of human behaviours. In short, the development location, types of land use and the water management measures employed show clear evidence of the strengthening of the 'controlling of nature' type in floodplain management practised in the Rhine-Meuse delta region in the twentieth century.

(II) Different degrees of control over nature amongst different actors

Despite evidence of the predominance of the 'controlling of nature' type in floodplain management practised in the Rhine-Meuse delta region explained above, different degrees of control over nature amongst different actors were observed. De Moel *et al*. (2011) indicated that the areas that were less prone to floods were likely to be developed for residential uses than for other uses like commercial and infrastructural facilities. In addition, the statistical data on employment by sector in 2007 showed that almost 50% of employment in agricultural-related activities were located in flood-prone areas, whereas it was only less than 30% for industrial-related activities (CBS 2009). Industrial activities were concentrated in the relatively higher-elevated provinces, such as in the vicinity of Eindhoven, part of Brabant, Limburg and raised areas in Rotterdam (CBS 2009). The evidence above reveals the different degrees of uncertainty avoidance across sectors and across different types of business amongst the private sector.

(III) Continuation of traditional social organisation models in floodplain management

As with resource management practices, traditional ways of social organisation in floodplain management have also been well maintained in the region during the twentieth century. New development projects in the designated areas for development promoted by the government (VINEX locations) are examples of this. Despite the high share of the private sector in the development in the VINEX location, strong cooperation with the public sector at different scales through negotiation processes was widely observed (Kruythoff and Teule 1997). The public sector remains the competent authority for infrastructure provision and maintenance. This includes the provision and maintenance of water infrastructure. This shows that the unique form of social organisation, associated with strong roles of the public sector based on collectivised management approaches in which individual interests and benefits are incorporated, has been maintained in the territorial development during this period of development.

7.1.3 Planning practices in response to recent extreme flooding

Since the construction of the mega-projects for flood defences after the 1916 and 1953 floods, the Rhine-Meuse delta region has never experienced catastrophic floods. The most recent flooding events in the region occurred in 1993 and 1995. Unlike the 1953 flood caused by storm surges, these flooding events were caused by the great amount of excess water coming from upstream rivers. People living in these river areas were asked to evacuate. This was due to the estimated critically high risk for dike breakages, which would result in great damages to the polder areas (Bezuyen *et al.* 1998). A state of emergency was declared in several areas, with suggestions for evacuation. Despite the refusal of some entrepreneurs to evacuate at the beginning, the evacuation was successfully carried out (Bezuyen *et al.* 1998). The dikes, however, did not break down in the end. These responses to the flooding events show a high degree of uncertainty avoidance in management practised by all sectors in the region during the 1990s.

However, these potential flood situations resulted in changes in floodplain management practised in the region. Yet, the changes occurred in each sector to different degrees. The changes in the public sector were very evident, as shown in policy changes launched by the Dutch government in consultation of the Deltacommissie (2008). In response to the flooding events in 1993 and 1995, the government launched new policies in the 2000s under the 'working together with nature' principle. These new policies presented changes in Dutch formal institutions towards the floodplain management approach that integrates more with nature and involves a lower degree of uncertainty avoidance. 'Room for the River' programme, which is part of the new Delta Programme, is an evidence of this change in the Rhine-Meuse delta region ("Room for the River" n.d.). The change towards more integration with nature of the non-public sectors actually began since the late 1960s in the form of environmental movements, which led to several changes in actions of the public sector in the following decades (see Section 6.1.3 for further detail). Effects of this change were, however, still rather limited in the twentieth century; its effects became obvious in floodplain management approaches practised in the region only in the 2000s, especially amongst the public sector.

For the private sector and civil society, this new management approach was accepted by only part of the population affected directly by the implementation of these policies. Evidence of the minimal effects of the new management approach on the practices of the private sector and civil society is the spatial development patterns in the region, which continued to expand into provinces that are naturally more flood prone, but are well protected by high-standard flood defences, as described earlier in Section 7.1.2. However, acceptance of the new management approach was also observed in recent developments. An example of this is shown through the implementation of the 'Room

for the River' programme in Overdiep in 2011. Approximately half of the companies and households decided to move out of the area. Another half of the companies and households in Overdiep agreed with the '*terp plan*' to relocate on a newly built 6 metre-high mound (*terp*) in the area where polders would be lowered. These companies and households received subsidies from the government in order to adapt to the new conditions. The government assures compensation if the area is flooded, with an expected flooding frequency of 1 in 25 years ("Depoldering of Overdiep" n.d.).

The evidence above shows that there were a significant number of people directly affected by policies that accepted the new management approach in practice. Nevertheless, it should be noted that the acceptance of the new management approach in this case might reflect not only the acceptance of the management approach with greater nature integration and a lower degree of uncertainty avoidance. But the success of policy implementation might also reflect the ability of the Dutch social organisation model to generate desirable outcomes, even in the cases where the policy approaches does not conform to the locals' attitudes and their management cultures. This premise is further investigated in Part III.

7.1.4 Summary of planning practices and spatial development outcomes in the Rhine-Meuse delta region

Figure 45 and Figure 46 summarise the floodplain management practices of the involved actors in the Rhine-Meuse delta region regarding the aspects of resource management and social organisation respectively. In general, the analysis reveals that the traditional ways of management regarding both resource management and social organisation have been strongly maintained in the practices of all sectors. However, these traditional ways of management have evolved through time. Through this evolution, other management approaches were integrated into traditional methods in order to improve the effectiveness of the systems. These approaches being integrated include (i) management approaches associated with a higher degree of nature integration and a lower degree of uncertainty avoidance (which remained rather limited amongst experts and the public sector) and (ii) centralised management planned by experts for the benefit of a broader territory than the territory under the responsibility of a single water board.

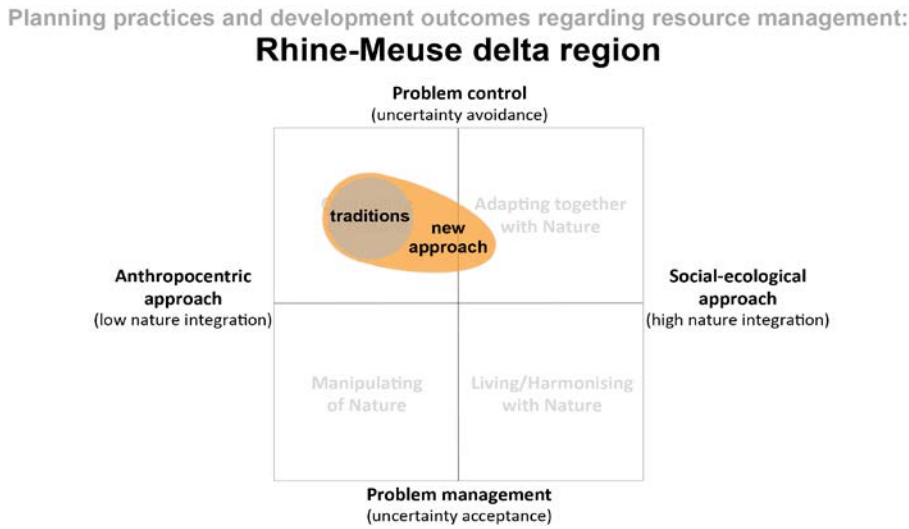

Figure 45
Floodplain management regarding resource management practised in the Rhine-Meuse delta region

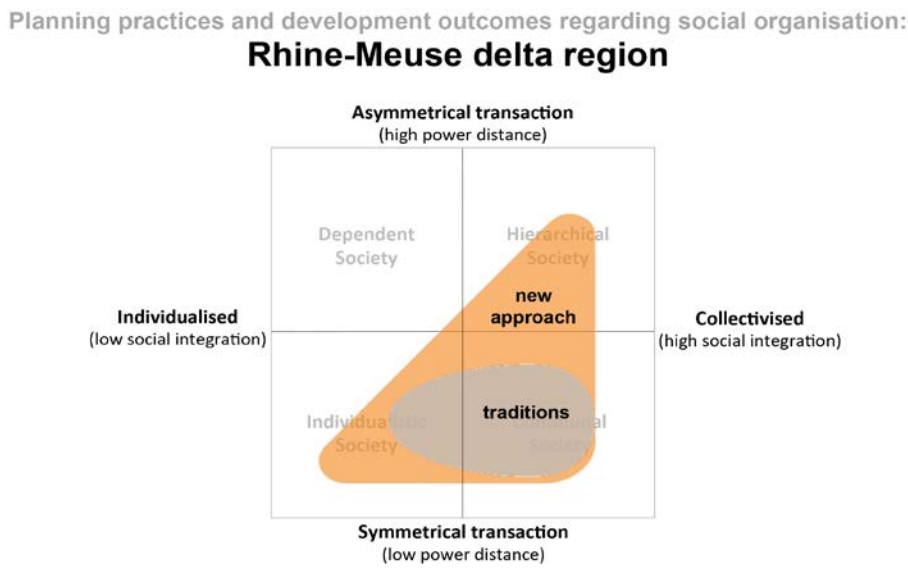

Figure 46
Floodplain management regarding social organisation practised in the Rhine-Meuse delta region

7.2 Planning practices and spatial development patterns in the Chaophraya delta region

Unlike the Dutch case, formal forms of floodplain management in the Thai case did not exist until the twentieth century. However, the analysis of floodplain management practised in the Chaophraya delta region covers also the development period before the establishment of the formal institutions competent in water management in particular. It is divided into two periods for analysis. The first period is the early period of urban development in the Chaophraya delta region, starting from the establishment of Bangkok as the capital city of the country in 1782. The second period is marked by administrative modernisation and the establishment of the Royal Irrigation Department - the first formal institutions in water management in Thailand - at the turn of the twentieth century. Analysis of management cultures present in the forms of management measures and instrument taken to cope with floods and spatial development patterns in different parts of the region is elaborated below.

7.2.1 Planning practices and spatial development patterns from the eighteenth century to the turn of the twentieth century

In general, floodplain management practised during the early period of urbanisation in the Chaophraya delta region were associated with a low degree of power distance, corresponding to the 'communal' and the 'individualistic' types of social organisation. Evidence of this was that most of the activities regarding territorial and water management were often undertaken by the communities or individual households (Tanabe 1977, cited in Askew 2000). Regarding aspects of resource management, the analysis reveals the practices that corresponded to a management approach into which nature is well integrated. This management approach refers to both the 'living with nature' type and the 'adapting together with nature' type of resource management. The evidence of the predominance of this management approach was the location choices for land development and the ways people dealt with floods as elaborated below.

Settlements in the Chaophraya delta region took place partly due to advantages regarding the fertility of this vast floodplain brought by floods (Hungspreug *et al.* 2000). This means people had rather positive attitudes towards floods; living with floods was considered acceptable or even advantageous. The early settlements in the region were concentrated on relatively high ground and natural levee along the river (Wallipodom 2000). The low-lying and swampy areas, which were often submerged during annual flooding periods and intensive local rainfalls and thus unsuitable for farming and settlement, were usually left unattended (Hungspreug *et al.* 2000). This location choice

and adaptation to floods through suitable land uses corresponded to the 'adapting together with nature' type of resource management.

Yet, settlements on the relatively high ground also experienced floods in the in the years with extreme rainfalls. People developed amphibious innovations that enabled them to live their usual life during occasional flooding periods in flood vulnerable areas (Tanabe 1977, cited in Askew 2000). These innovations included, for instance, living in houses on stilts or floating house, raised-bed orchard farming techniques and floating rice and vegetables (Jumsai and Buckminster Fuller 1988; Jarupongsakul and Kaida 2000; Nontnart 2011), as shown in Figure 47.[14] These measures to cope with floods corresponded to the 'living with nature' type and the 'adapting together with nature' type of resource management. Nonetheless, these measures have vanished after the construction of the dams in the upstream, which reduced the frequency and extent of floods in the region (Jarupongsakul and Kaida 2000).

Figure 47
Houses on stilt along the canal in Bangkok (left) and raised-bed orchard farming in Bangkok (right)

There were also reports about the 'living with nature' type of management in the dense-urban area in the Chaophraya river basin. An example was the town in Bang-li in Suphanburi, which is a province adjacent to the case study area. Here, row houses were linked on the second floor by front balconies, as shown in Figure 48. These connected balconies functioned as a walking path for a few months during annual flooding periods. A few days before the town was flooded, which could usually be noticed from the water level in the river, the residents would move their possessions to the upper level and continued their daily lives by leaving the ground floor submerged (Jumsai and Buckminster Fuller 1988; Rungrattawatchai 2011). This amphibious

14 Floating rice is a type of rice with submergence tolerance and kneeing abilities, which was commonly found in the Chaophraya delta region. It can grow quickly (up to 5 metre high) to become free from inundation and can stay inundated for about a month (BRRD n.d.).

type of architecture had, however, vanished since the 1980s, after the construction of several dams in the upstream that reduced the frequency and extent of flooding in the Chaophraya delta region (Rungrattawatchai 2011).

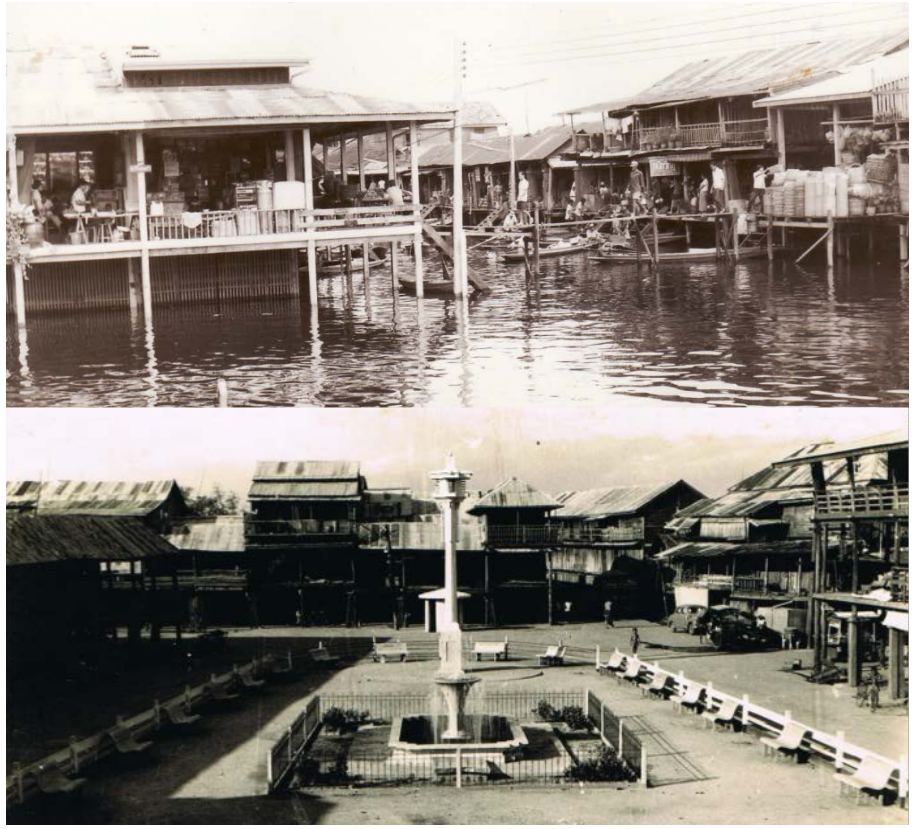

Figure 48
The amphibious community in Bang-li in wet season (above) and dry seasons (bottom)
Source: Rungrattawatchai (2011)

7.2.2 Spatial development patterns since the twentieth century

The formal form of water management in the Chaophraya delta region were established in this period, underpinned by the processes of country modernisation, which started in the midst of the nineteenth century (see Section 6.2 for detail). The changes of formal institutions resulted in changes of floodplain management practised in the region. There are three significant observations regarding change and persistence in floodplain management practised in this period compared to those in the previous period of development.

(I) Changes towards the 'anthropocentric' resource management approach

In this period of development, changes in the traditional 'social-ecological integration' resource management approach towards the 'anthropocentric' approach were observed, especially in the new settlements. From the analysis of spatial development patterns, practices corresponding to the 'controlling of nature' type of resource management were predominant. Practices corresponding to the 'manipulation of nature' type were also observed from the management measures taken to cope with floods during this period of development, as explained later in Section 7.2.3. Evidence of practices that correspond more to the 'controlling of nature' type of resource management was land reclamation and urban expansion in the previously uninhabited low-lying and swampy areas.

The processes of change started with the extension of land development into swampy areas in the late nineteenth century. Water was drained out through canalisation projects in order to get dry land for cultivation (Molle 2005). The idea of reclaiming swampy areas and measures for reclamation corresponded to the 'controlling of nature' type of resource management. The practice of 'controlling of nature' was followed by the construction of several dams upstream in the early twentieth century. These dams reduced the frequency and extent of flood occurrence in the region. The implementation of this 'controlling of nature' type of resource management resulted in rapid urban expansion into the low-lying areas that are naturally prone to floods (i.e. the east of the Chaophraya river). Figure 49 shows the evolution of urban expansion in the region between 1900-2002. It shows that the expansion already began in 1971 and became significant by 1988. However, the expansion was limited only to the medium flood-prone areas at that time. The vast urban expansion into the areas that are highly prone to floods (i.e. the northeastern part of the region) can be observed in 2002. This shows the increasing degree of 'controlling of nature' over time.

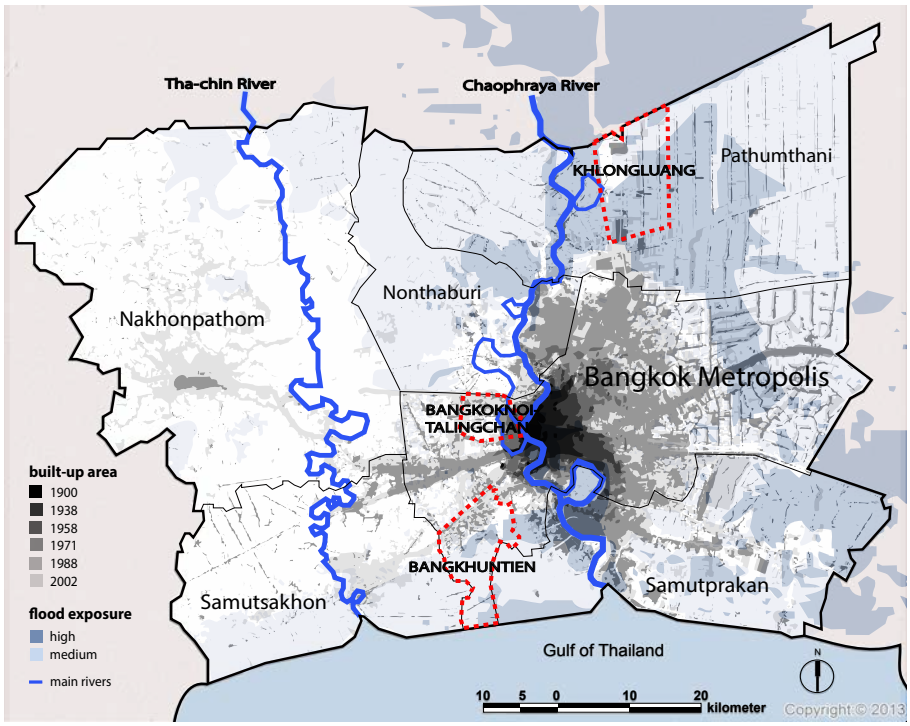

Figure 49
Urban expansion in the Chaophraya delta region between 1900-2002
Sources: Analysis is based on data provided by the Land Development Department (LDD 2000), the Department of Water Resources (DWR 2010), the Department of Public Works and Town & Country Planning (DPT 2008) and Mekvichai (2007); and ArcGIS online database (ESRI n.d.) for base map

(II) Changes regarding the most influential actor in the territorial development process

The urban expansion into flood-prone areas was partly influenced by the Greater Bangkok Plan for 1990, which was prepared by American consultants - Litchfield Whiting Bowne & Associates - in 1961 (RIDA 1996; Sternstein 1971).[15] Based on suggestions in the plan, the state provided infrastructure in the flood-prone areas, which induced urbanisation processes to take place in these areas. The uses of the land, mainly for agricultural purposes, were converted for industrial, residential and commercial uses (Askew 2003; Ouyyanont 2000). The patterns of urban land use in these new development areas were influenced mainly by private developers

15 The Greater Bangkok Plan for 1990 was the first urban development plan, which provided guidelines regarding land use and infrastructure provision for the development of Bangkok and its vicinity. Foreign experts took the dominant roles in this planning, while local experts were involved mainly as to receive training from them (Veerapalin 2011).

(Srisawalak-Nabangchang and Wonghanchao 2000). This is because most of these low-lying areas were owned by landlords with large land holdings (Molle 2005), along with the rather limited role of the public sector due to its weak authority for enforcement of planning and control measures in the twentieth century.

The evidence above shows the strong role of the private sector in territorial development processes during this period of development, with support from the public sector mainly through infrastructure provision. The most influential actors in the territorial development processes during this period were different from those influential in the development processes in the earlier period of development. This difference was underpinned by changes of land policy from the traditional occupancy-by-use land tenure system towards a title deeds system in 1901. In simple words, the occupancy-by-use land tenure system created the conditions in which most of the developed land were owned by households based on smallholdings; the title deeds system created the chance for landlords to own the vast amount of land based on large holdings (Rongwiriyaphanich 2012). This means the new land policy changed the group of actor that were most influential in territorial development processes all the way from the civil society to the private sector. It should be also noted that the dominant role of the private sector was supported by the state's provision of infrastructure, and the state's intervention was largely based on suggestions from external (foreign) experts.

(III) Persistence of the traditional 'individualistic' type of social organisation

It was observed that the traditional 'individualistic' type of social organisation in territorial and water management practised in the Chaophraya delta region remained unchanged in this period, despite the increased role of the public sector in floodplain management created by the administrative modernisation at the turn of the twentieth century. This claim is supported by the non-existence of public infrastructure for flood mitigation during the initial state of land reclamation and development in the newly developed areas. The measures employed to cope with flood-related issues in these development projects were executed by private developers, mostly through landfills, permanent flood barriers and the temporary installation of sandbag embankment and water pumps during occasional floods (Hungspreug *et al.* 2000). The implementation of these measures shows not only the 'individualised' management approach, but also the evidence of private sector practices that were associated with the 'anthropocentric' management approach. Whether similar changes occurred also in the practices of the civil society in this period was unclear from the analysis of spatial development. This issue can be seen more clearly from the analysis of the management measures taken during the extreme floods of the twentieth and twenty-first century, as elaborated below.

7.2.3 Planning practices in response to recent extreme flooding

The review of management measures in response to the recent extreme floods is argued to be helpful in better understanding the recent changes of floodplain management practised in the Chaophraya delta region in the period in which rapid changes in spatial development have taken place. It includes the analysis of both the resource management and social organisation aspects in floodplain management. Since the twentieth century, there have been four momentous flooding events occurring in the Chaophraya delta region in 1942, 1983, 1995 and 2011 (see Chapter 4 for further explanation about causes and effects of the floods). These flooding events reveal two main points that are significant for the analysis in Part III, in order to identify factors influencing cultures, planning policies and outcomes regarding floodplain management in the Chaophraya delta region. They are described below.

(I) Different management approaches practised by different sectors

During these flooding events, the competent authorities in the management of flood-related problems employed several preventive measures corresponding with the 'anthropocentric' resource management approach. These included both the use of dams and water channels to regulate water based on hydraulic engineering solutions and the temporary installation of flood barriers and water pumps to manipulate excess water with the aim of protecting urban areas. These two management measures corresponded to the 'controlling of nature' and the 'manipulating of nature' type of resource management respectively. The competent authorities employed also other measures in special situations. There was, for instance, the provision of information about the timing of daily tides to households in the affected areas in 1995 by the BMA, so that people could adapt their activities in response to the tides. This 'living with nature' type of measure was applied to the areas on the west of the Chaophraya River, including in Bangkoknoi-Talingchan, where canal systems were interwoven and still connected to the river. As a result, water overflows were closely linked to the tides. Another measure was the calls for evacuation in 2011, which were not widely adhered to by civil society as elaborated below.

The management measures taken by the private sector and civil society to cope with flooding were rather different from the attempts of the public sector to control and manipulate water. In general, the civil society employed several common measures during all these flooding events. Figure 50 shows that people continued their daily lives during all of the flooding events, which lasted for a few months. They relocated their households' assets to upper level and continued their daily activities during the inundated periods. Commuting with boats has been common; yet, slight changes in modes of transport over time were observed. Commuting via the paddle and ride system (boats connecting with buses or trucks) along with using temporary elevated

walkways has become more common over time. This was partly because road transportation has become a more dominant commuting mode of transport after many canals in Bangkok were filled in and converted into roads and urban areas have extensively expanded.[16] In addition, it was observed that floods were not considered as harmful to life. The archived documentary film recorded that many people went out on a boat to enjoy the scenery created by the flood and also for fishing during the flooding event in 1942 (Prakardwuttisan n.d.)[17] Figure 50 shows similar activities in 1983 and 2011 that kids were enjoying playing in water and people did fishing on the inundated streets.[18] Another significant observation was the adaptation of daily activities in response to tidal conditions employed by people living in the affected areas on the west of the Chaophraya River in 1995.

16 These changes were triggered by the suggestions provided by the Greater Bangkok Plan for 1990 (DTCP 1960).

17 Fishing during floods was commonly found in the Chaophraya delta region in the past. It has vanished in the urban areas, but has remained rather common in rural areas (Nontnart 2011).

18 Several photos presented here are taken from unofficial sources, such as newspapers and private webpages. They may distort or present only one side of the reality to certain extent. However, these photos are cautiously selected by the author, as they are considered conforming to author's personal experiences on flooding events.

Figure 50
Management measures taken to cope with extreme floods in Bangkok
(on both left and right pages)
Sources: 1 and 2 = Nawigamune (2009) | 3, 4,6 and 7 = Bangkok Post ("Bangkok Flooding in 1983" 2011)| 5= Suttisakorn (2003)| 8 = Manager ("Momentous Flooding" 2005)| 9 = Thairath ("Critical Floods in 1983-1995" 2011) | 10 = Limnontakul (2011)| 11 and 12 = Bangkok Post ("Battle for Bangkok " 2011) | 13 = Net-photography ("2011 Flooding in Thailand" n.d.) | 14 = Nation Radio Network ("Reports on Flooding Situation in 2011" 2011) | 15 = Bangkok Post ("Splash from the Past" 2011) | 16 = Nation ("Flooding Crisis in Bangkok" 2011) | 17 = The Atlantic ("Worst Flooding in Decades" 2011) | 18 = Matichon ("How the Rich" 2011)

These measures generally corresponded to the 'living with nature' type of resource management. The aforementioned evidence shows strong remnants of the traditional way of 'living with nature' type of resource management in the region. However, there were several significant differences in measures taken to cope with floods amongst these events, as elaborated below. This study argues that these differences present changes in floodplain management practised in the region over different periods of development.

(II) Changes towards the 'anthropocentric' resource management approach with persistence of the individualised characteristics in social organisation

Despite strong remnants of the traditional 'living with nature' type of resource management in the region, broader influences of the 'anthropocentric' management approach (corresponding to the 'manipulating of nature' type) in floodplain management were observed in the practices of the private sector and the civil society. This change was apparent especially in the management measures taken to cope with flooding in 2011. The installation of temporary flood barriers (cement walls and sandbag barriers) and water pumps in the areas where inundation was expected was undertaken by households, communities and private enterprises more extensively than before. Yet, it was observed that the management practices based on a low degree of uncertainty avoidance in regards to flood were likely maintained. This argument was supported by how a significant number of residents in many seriously affected areas chose to stay in the inundated areas, despite the government's announcement for evacuation during the flooding event in 2011. These people chose not to evacuate and employed the 'living with nature' type of measures to adjust their lives to flooding conditions. The rationale underlines such reaction was based on how people conceive and balance different types of risk. In simple terms, people conceive that staying in inundated home is likely to result in less loss than if they evacuated.

The observations above show also the strong characteristics corresponding to the 'individualistic' type of social organisation in the management of flood-related problems in the region practised by the private sector and the civil society. The dominance of individualised characteristics over collectivised characteristics in the practices of civil society were evident in the reasons underlying the breakdown of the state's flood prevention systems in most areas in 2011. Besides technical failures, the collapse of the systems was caused also by the failure of the public sector and civil society to cooperate. Temporary flood barriers installed by the competent public authorities were opposed and pulled down by local residents in many areas. These measures aimed to reduce the water level in their neighbourhoods.

However, it was observed that cooperative failures occurred to a lesser degree when the management was led by actors other than the state. This is present, for instance, in the two successful cases in the Chaophraya delta region that collective-based

management during the 2011 flooding event were successfully implemented and led by local communities (see Section 7.2.4 for further detail). Several studies in political ecology argued that the real frontier in catalysing environmental awareness and action in Thailand lies with other informal institutions, such as NGOs, Buddhist monks, students and the media and is often based on anti-state perspectives (Rigg 1995). Thus, this study argues that the failure to implement collective-based management policies under a 'hierarchical' social organisation structure may be attached to specific conditions regarding cultures and institutions.

This study also observes that the attachment to informal institutions created a paradox regarding social organisation approaches in the Thai context of floodplain management. Despite the likelihood of denial in admitting the collective-based management policies, the collectivised characteristics of Thai society have been evident during all extreme flooding events since the past to the present, as shown in Figure 51. This was present in the form of massive amount of voluntary labour and resource donation to build sandbag flood barriers and to help people who were seriously affected by floods. This paradox is argued here as being underpinned by differences between the cultures in regards to social organisation in general (i.e. not specific to the aspect of flood-related issues) and traditions in floodplain management practised in the region. This issue is further elaborated in Chapter 8 and Chapter 9.

Figure 51
Volunteers and donated articles for helping the disaster victims during the flooding events in 1983 (left) and in 2011 (middle and right)
Sources (from left to right): Bangkok Post Bangkok Post ("Splash from the Past" 2011), Thairath ("Call for Volunteers" 2011), The Journal ("Thailand: Death Toll" 2011)

7.2.4 Variation of planning practices and spatial development patterns in the Chaophraya delta region at the local level

Spatial development in relation to aspects of resource management

Figure 52 and Figure 53 present changes in land uses during the last few decades in Bangkoknoi-Talingchan and Bangkhuntien respectively. As spatial data for analysis of Khlongluang is not available, the analysis of land use changes in Khlongluang is based mainly on reports from previous studies. The analysis reveals that settlements were already widely dispersed and slightly dense in some areas in Bangkoknoi-Talingchan in 1986, whereas they were still rather limited and only clustered in small areas within the other two districts. This difference could possibly be explained by their distinctive geographical characteristics. This is because settlements before 1986 tended to be located in the areas that are less prone to floods (such as Bangkoknoi-Talingchan) than in the areas that are highly prone to floods (like Khlongluang and Bangkhuntien). Rapid urban expansion was found in all three districts in a few decades afterwards, as shown in the existing land uses in 2009 (see Section 4.2.3 for land uses in Khlongluang). Significant differences in spatial development patterns amongst the three districts were observed. In general, the analysis of spatial changes shows that the processes of urbanisation in Bangkoknoi-Talingchan were relatively less intensive than those in the other two districts, despite its greater proximity to the CBD of Bangkok. Details of the differences in spatial development across districts are elaborated below.

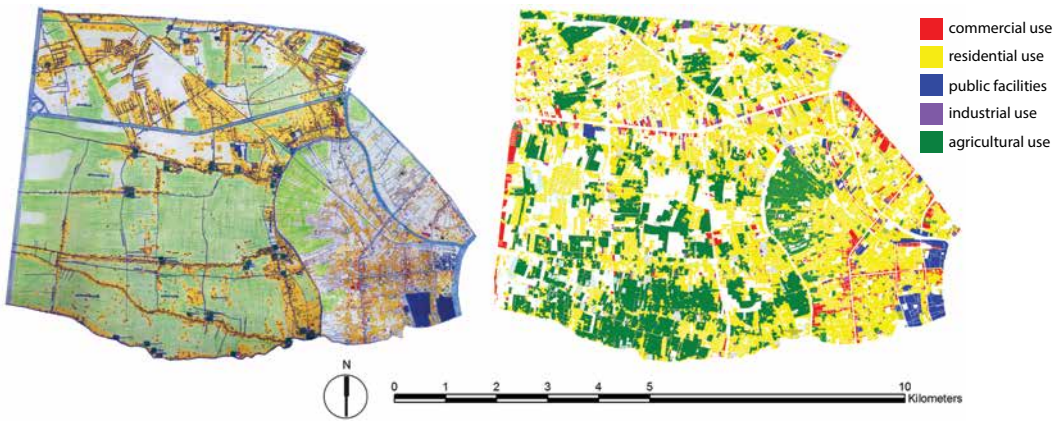

Figure 52
Land use in Bangkoknoi-Talingchan in 1986 (left) and in 2006 (right)
Sources: Department of Public and Town & Country Planning (DTCP 1986; DPT 2006)

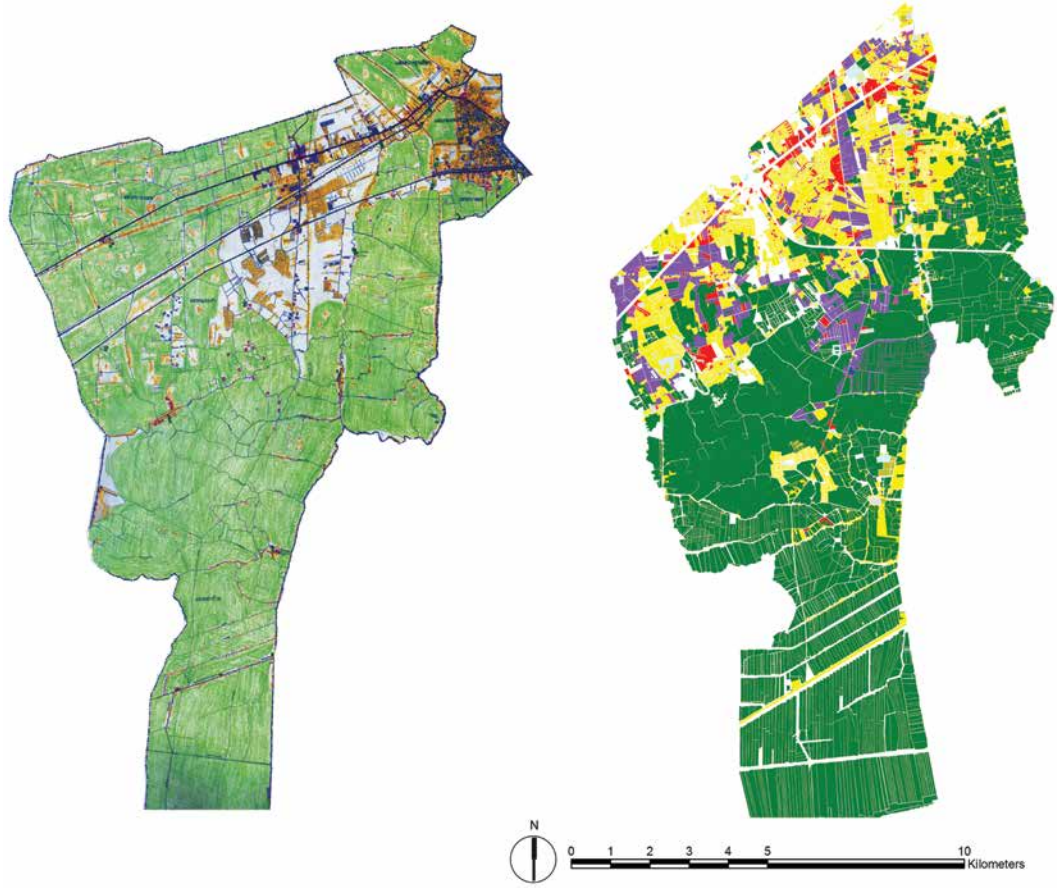

Figure 53
Land use in Bangkhuntien in 1986 (left) and in 2006 (right)
Sources: Department of Public and Town & Country Planning (DTCP 1986; DPT 2006)

In Bangkoknoi-Talingchan, land was developed with relatively low density for agricultural and residential uses. It has been observed that rural characteristics of the area have been rather well maintained. Houses located in the middle of raised-bed orchards are still apparent. Despite how many parts of this area has been converted into gated communities, it was observed that the traditional spatial development patterns, where green and water networks are interwoven, have been rather well maintained and promoted by the new development areas. This is illustrated in Figure 54. This development pattern corresponds to the 'adapting together with nature' type of resource management.

In Khlongluang, on the contrary, land was developed with a rather high proportion of land uses that are highly vulnerable to floods, such as large-scale manufacturing factories, public institutions and high-density housing with noticeably low blue and green ratio. This spatial development pattern is clearly visible in Figure 54. This spatial development pattern was the result of investments from the private and public sectors in large-scale development projects, with support from the public sector in the form of infrastructure provision and legal supports (such as a tax-free investment zone). It was also observed that landfills were commonly employed when developing these low-lying lands. Flood barriers were constructed in only a few development projects (such as in Navanakorn industrial promotion zone). This urban development pattern shows the continuation and even strengthening of the degree of control over nature in the management practices in Khlongluang. This process of changes began in the last two decades in the nineteenth century as a result of the reclamation of naturally swampy areas through privatised canalisation projects to drain out water to convert the land to be cultivatable (see Section 6.2.4 for detail of the reclamation policy).

In Bangkhuntien, urban settlements have extended into the areas that are more prone to floods than the areas where settlements in 1986 were clustered. The boundary for urban extensions was however rather noticeable, as shown earlier in Figure 53. It shows that urban settlements were limited mainly to the areas to which daily tidal effects were marginal. Nevertheless, scattered medium-scale development projects in the areas being regularly affected by daily tides were visible. These spot settlements were partly triggered by the construction of roads and the expansion of a public university (KMUTT) during the 1970s – 1980s in the adjacent district, which is located also in the area associated with a high degree of flood exposure. Similar to the development in Khlongluang, the urban settlements also consist of a noticeable amount of activities that are highly vulnerable to floods, such as industrial and commercial uses. Private developers and entrepreneurs invested in these development projects, which were also supported by the public sector through infrastructure provision.

Despite the rather similar changes of land uses in Khlongluang, the spatial development pattern here was less dense and incorporated more of nature than the development pattern in Khlongluang. The scale of most private development projects here, either for residential or industrial uses, was also much smaller than those in Khlongluang. Additionally, the balanced occupancy between individual households and gated communities, similar to the situation in Bangkoknoi-Talingchan, was also observed here. In short, the spatial development pattern in Bangkhuntien presents the combination of the development patterns in the other two districts, in which the modernised ways of territorial development led by the private sector are apparent while part of the traditional management practices has been also maintained.

The evidence above regarding different land uses and spatial development patterns reveals that the aspects of 'nature integration' in floodplain management was most concerned in Bangkoknoi-Talingchan and least concerned in Khlongluang. This difference is shown clearly in Figure 55, which shows more integration with green and blue networks in the residential areas in Bangkoknoi-Talingchan and Bangkhuntien than in Khlongluang. In addition, the analysis also shows that the most influential actors in territorial development processes in the three districts are different, and the influential actors are strongly related with land ownership. From the evidence above, this study argues that the different degrees of 'nature integration' amongst the three districts were likely influenced by different land ownership patterns; different land ownership patterns imply a correlation to the different influential actors of each area in the territorial development processes. In the case of the Chaophraya delta region, it means that the civil society tended to employ management practices based on a higher degree of nature integration than the private and public sectors did.

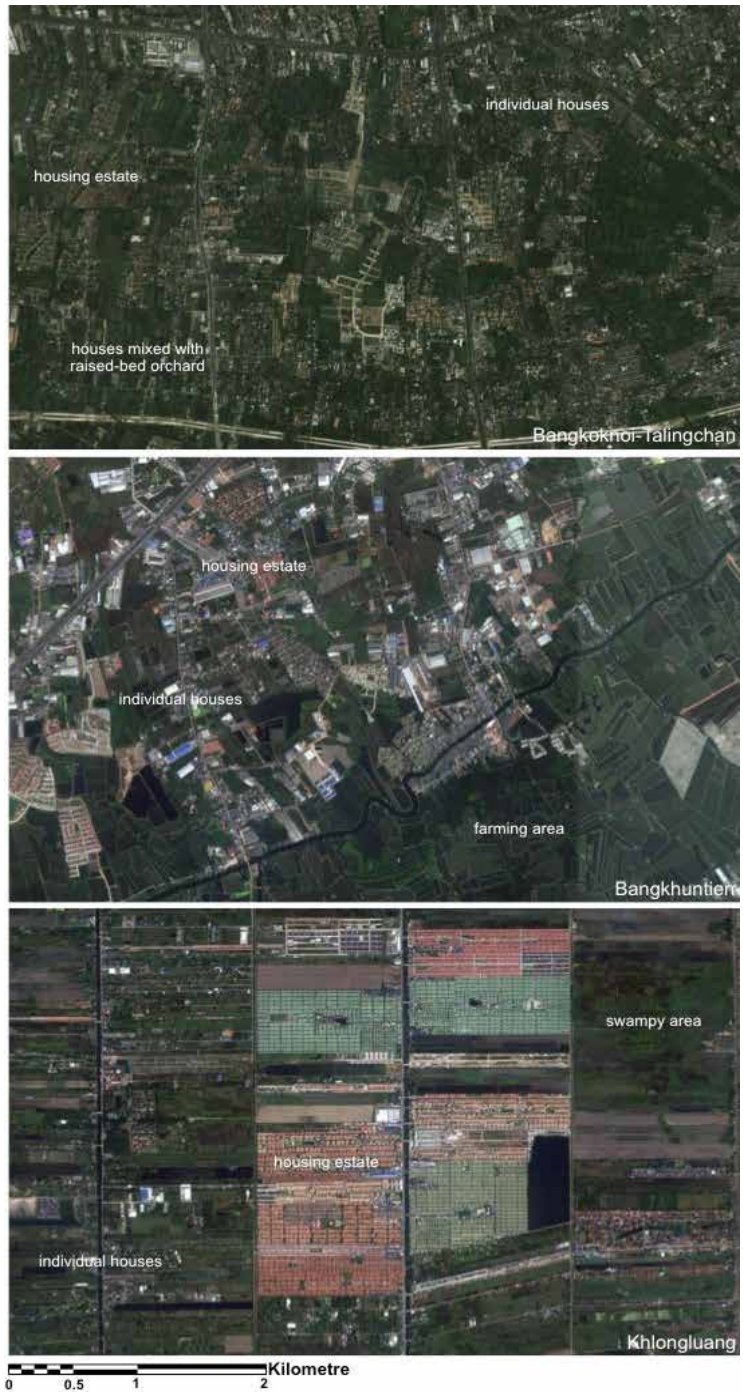

Figure 54
Spatial development patterns in Bangkoknoi-Talingchan, Bangkhuntien and Khlongluang
Source: Aerial photos provided by Google Maps (accessed on 23 June 2013)

Figure 55
Housing estates in Bangkoknoi-Talingchan, Bangkhuntien and Khlongluang
Source: Aerial photos provided by Google Maps (accessed on 23 June 2013)

Management measures taken in response to floods in relation to aspects of resource management

According to interviews with respondents living in the three selected districts in the Chaophraya delta region, the respondents in Bangkoknoi-Talingchan and Bangkhuntien employed the 'living with nature' type of measures to deal with floods in the past more than the other types of measures and also more than the respondents in Khlongluang did. The 'living with nature' type of measures includes, for instance, living in houses on stilts and moving their possessions to the upper level. Yet, differences regarding the employment of the other types of measures were not evident. The practice of the 'living with nature' type of measure also manifested in the ways people in Bangkoknoi-Talingchan adapted their daily lives according to the tides during the 1995 flooding event, as explained earlier in Section 7.2.3. This evidence is likely supporting the observation above regarding more concerns given to the 'nature integration' in floodplain management practised in the two districts over those in Khlongluang. But it might also imply differences regarding the 'uncertainty avoidance' dimension. The latter argument is likely when considered the reason for employing the 'living with nature' type of measures given by respondents in Bangkhuntien. They stated that '*Flooding is a natural phenomenon. Water comes by itself and will go by itself. There is no need to fight with it*.' These statements imply not only a management approach that incorporates nature (social-ecological integration), but also the acceptance of the problem rather than an attempt to control it (uncertainty acceptance). This issue is investigated in further detail in the subsequent chapters.

Management measures in response to floods in relation to aspects of social organisation

The interviews made with respondents living in the three selected districts for the analysis of the measures taken to cope with floods in the past show three significant points regarding the employment of different social organisation management approaches. First, most of the respondents in all the three districts did not rely on (have no trust in) the management plans prepared by the competent authorities (referring to the hierarchical' type of management). Second, the differences in the number of respondents in each district who employed and those who did not employed the measures based on the 'individualistic' and the 'dependent' type of management were rather marginal. These two types of management refer to the prevention of individual's properties and requests for help and support from the public authorities respectively. Third, the differences regarding cooperation at the community level to cope with floods across districts were rather evident. This 'communal' type of management was commonly practised in Bangkhuntien, partly employed by a few respondents in Bangkoknoi-Talingchan, yet employed by none in Khlongluang.

From the evidence above, this study argues that people in the areas surveyed are likely to take actions to cope with floods by themselves, rather than relying on public authorities. This study also argues that different degrees of social integration is likely in the areas associated with distinctive physical and social attributes, although they are assumed to share common institutional frameworks (at the national or regional level, for instance). In other words, the degree of social integration in floodplain management seems to be lower in areas like Khlongluang. The underlying factor contributing to this phenomenon is not apparent from the interviews. The analysis of the collective-based floodplain management practices to cope with the 2011 flood in two areas in the Chaophraya delta region may provide a better understanding regarding factors underpinning those differences.

Figure 56 illustrates the locations of these two cases. They are (i) the district of Pak-kred and (ii) the gated community called 'Baan-fah-pi-ya-pi-rom' and its surrounding neighbourhoods in Lam-look-ka District. Although they are not part of the three scrutinised districts for analysis in this study, they represent the two types of settlements that are scrutinised for the analysis in this study. Pak-kred represents the type of settlements in which the traditional physical and social structures still exist (similar to the cases of Bangkoknoi-Talingchan and Bangkhuntien). The Lam-look-ka case represents the type of settlements in which most of the settlements are relatively new and the traditional social structure is weak or absent (similar to the case of Khlongluang).

In contrast to the failure to carry out the collective-based management measures by the competent public authorities at the region level as mentioned earlier, the collective-based management was successfully practised in these two areas. However, the local conditions and the experiences in these two areas were distinctive. In Pak-kred, it was reported that the municipality initially failed to maintain the flood barriers, which were temporarily installed aiming to protect most of the area in the district by letting some areas be inundated. Residents directly affected by the inundation pulled down the barriers, which aimed to reduce the level of water in their neighbourhood and instead used these sand bags to protect their own properties. The situation was resolved through negotiations led by a respected abbot. As a result, the residents agreed to corporate with the municipality and became volunteers for building and maintaining the flood barriers ("Pak-Kred Model" 2011), as shown in Figure 57. This evidence of the significant role of respected agents in social organisation in this case corresponds to the observations in several studies, such as Shigetomi (2003) and Hanks (1962, 1972), which indicate that in the Thai social organisation model '*... stability of the relations is assured by "love and respect"...*' based on individual relational systems rather than collective ones. The interviews of planners and evidence in media also show that the provision of immediate and continuous technical assistance and financial support from the municipality and private sector actors who

had businesses in that area was also a crucial element contributing to its success ("Pak-Kred Model" 2011; Kornissaranukul 2012).

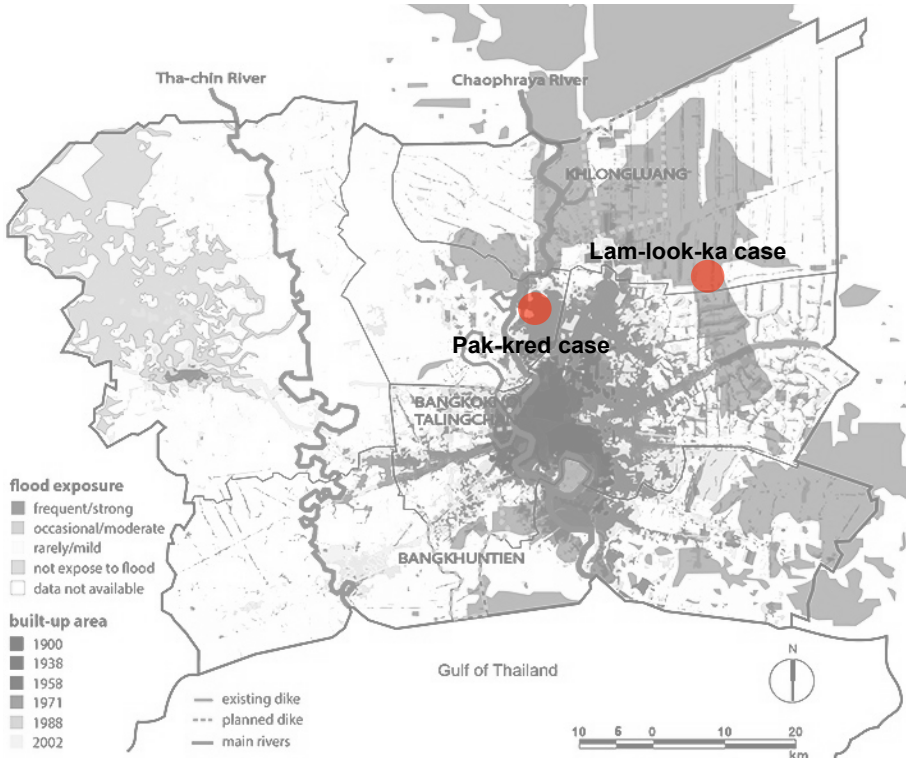

Figure 56
Locations of the two successful cases for implementing collective-based water management measures to cope with the flood of 2011

Figure 57
Volunteers gathered in temple and helped building flood barriers in the community
Source: Online highlight news ("Dedication and Unity" 2011)

The situation in Lam-look-ka, according to interviews with residents in the community (Interviews with the Local Residents 2012), was rather similar to the case of Pak-kred. Flood barriers and water pumps were installed by people living in gated communities, which are located on higher ground than the surrounding neighbourhoods. Residents living outside the gated community then pulled down the barriers, aiming to reduce the level of water in their neighbourhoods. Through communication and continuous support from the gated community given to those who were directly affected by the flood, residents in the surrounding neighbourhoods finally stopped destroying the flood barriers. The measures to maintain flood barriers and support given to the surrounding neighbourhoods were undertaken based on voluntary work by the residents in the gated community. All of these cooperative activities were carried out with the strong leadership of the head of the gated community's community committee.[19] There was no support from any formal and informal institutions (such as a municipality and a temple) like in Pak-kred.

19 A community committee is a form of informal organisation commonly found in gated communities. It is in charge of managing general business. Members of the committee are usually volunteers who elect the head of the committee.

In short, the experience in Pak-kred reveals the likely significant influences of social structures and informal institutions in floodplain management practices within the areas in which traditional physical and social structures still exist. Yet, the success of implementing collective-based flood mitigation measures in Lam-look-ka shows that collective tasks could also be achieved in the areas in which most of the settlements are relatively new and the traditional social structure is weak or absent. The main difference between the successes in the two cases was the actors involved in the processes. Yet, the factors underpinning the success in the two cases seem to be in common. The experiences in the two cases reveal that successes were likely brought on by management practices based on asymmetrical transaction led by actors other than the state. The transaction is likely based on individuals' connection and negotiation rather than organisation, which corresponds to the 'dependent' type of social organisation. This is supported by Molle (2003, 258) arguing that '*[t]he allocation of water follows a typical top-down decision-making process that partly embodies the bargaining power of the different provinces concerned*' and '*... constituencies' representatives have long mediated requests for water as a way to act as patrons and gain political rewards in times of election*.' There might also be other elements contributing to the successes in some areas only, which are to investigate further in the subsequent chapters.

7.2.5 Summary of planning practices and spatial development outcomes in the Chaophraya delta region

Figure 58 and Figure 59 summarise the floodplain management approach practised by different actors in the Chaophraya delta region regarding aspects of resource management and social organisation respectively. The illustrations are as simplified as possible and variations across districts are excluded. In short, the analysis reveals that the civil society has rather well maintained the traditional 'living with nature' type of resource management in their recent management practices. Yet, it was also observed that the floodplain management practices have slowly changed from the traditional 'social-ecological integration' management approach towards the more 'anthropocentric' approach. The change towards a more 'anthropocentric' approach in management practices was more evident amongst the private and the public sectors, especially in relatively new development areas.

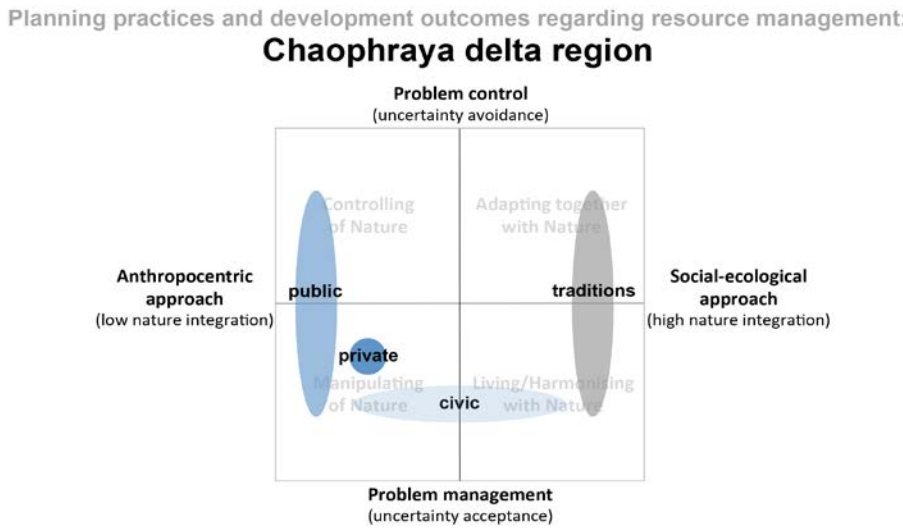

Figure 58

Floodplain management regarding resource management practised in the Chaophraya delta region
Note: traditions refer to practices in the early settlements (until the turn of the twentieth century for the public and the private sectors and until the turn of the twenty-first century for the civil society)

Regarding social organisation approaches, predominance of an 'individualised' management approach over a 'collectivised' approach was observed in the practices of the private sector and the civil society. In addition, the 'hierarchical' type of floodplain management employed by the state seems to be generally rejected by civil society. However, evidence from the sub-national analysis shows that collective-based management practices under a special form of asymmetrical transaction in management of flood-related problems were successfully implemented in some communities.

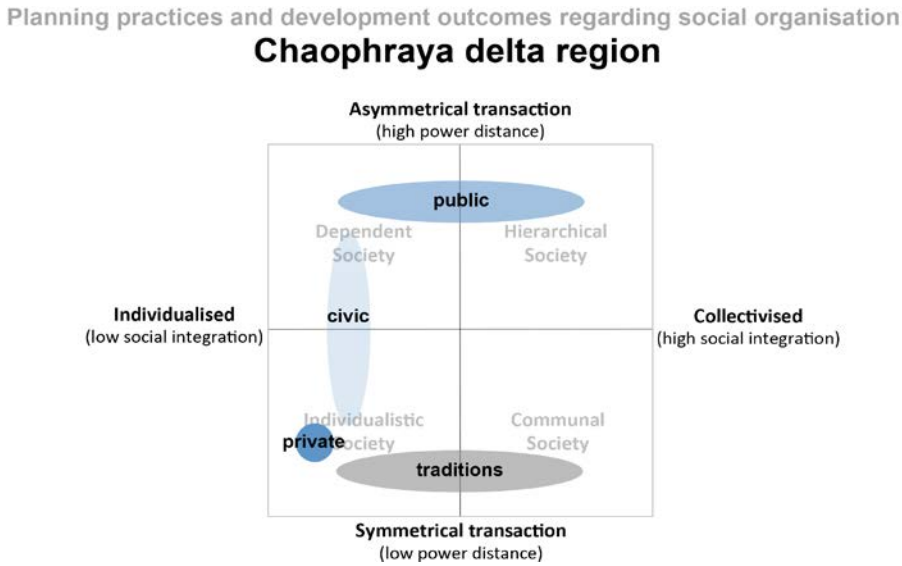

Figure 59
Floodplain management regarding social organisation models practised in the Chaophraya delta region
Note: traditions refer to practices in early settlements (until the turn of the twentieth century for the public and the private sectors and until the turn of the twenty-first century for civil society)

7.3 Comparison of planning practices and spatial development outcomes in the two delta regions

The analysis of floodplain management practised in the two delta regions reveals three main features, which are relevant to the examination of the influences of culture in territorial management processes in the specific context of floodplain management. First, it shows that the traditional management practised in the two regions were rather different from one another. The traditional floodplain management approaches practised in the Rhine-Meuse delta region were associated with a high degree of uncertainty avoidance and a low degree of nature integration. This 'controlling of nature' type of resource management was operated under collective-based social organisation approaches in which individual interests were incorporated. Continuation of these traditional floodplain management approaches has been clearly observed in the practices of all actors with slight changes initiated just recently, as explained later.

The experiences in the Dutch case are rather different from the floodplain management practised in the Chaophraya delta region, in which great variations of management

approaches amongst different actors were observed. The traditional management approaches practised in the Chaophraya delta region were associated with a low degree of uncertainty avoidance and a high degree of nature integration. These management approaches were operated under individual-based social organisation approaches in which collective interests were indirectly incorporated. Although these traditional Thai management approaches have been maintained in some areas by specific actors (as shown in the sub-national level of analysis), floodplain management practised by different actors in most of the newly developed areas was different from traditional approaches. To put it in simple terms, variations in floodplain management practices across territories and between actors were observed in the Thai case. The variations existed in management practices regarding aspects of both resource management and social organisation.

Second, changes in practices over time were observed in both regions, but with notable differences. The way floodplain management practices in the Rhine-Meuse delta region changed was considered evolutionary, induced by endogenous factors. This was done by integrating other management approaches with the traditional ones in order to improve the effectiveness of the existing approaches. Unlike the Dutch case, changes in floodplain management practices in the Chaophraya delta region were considered as paradigm shifts, induced by exogenous factors.

Third, the analysis of the management approaches practised in the two regions since the turn of the twenty-first century reveals similar trends towards a significant increase of urbanisation in areas that are naturally highly prone to floods. In addition, management practices of the private sector in each the two case studies were observed as distinctive. Recent trends show that land development for industrial uses in the Dutch case tended to take place in areas that are relatively less prone to flooding, whereas industrial developments in the Thai case were concentrated in areas that are highly prone to flooding.

Based on the observations above, this study argues that floodplain management practices in the case studies were significantly influenced by both physical and social attributes, including local cultures. In other words, the different traditional management practised in the two delta regions studied likely imply the significant influence of cultures in the sense of institutional frameworks. Yet, the influence of physical attributes in floodplain management practices also seems to be crucial. This was evident in the variation of practices and spatial development patterns found in the three districts in the Chaophraya delta region, where this study assumes the existence of a common institutional framework. In addition, the different degrees of conformity in floodplain management practices across different groups of actors in the Dutch case over that in the Thai case also brought up an essential question for planners to understand what are the crucial elements underpinning this difference. The observations above and resulting questions are further explored in Part III.

PART III Interrelationship between Culture, Planning Policy and Development Outcomes in the Case Studies

Rationales and framework for the analysis in Part III

8 Influences of culture in floodplain management of the case studies from a synchronic perspective

9 Influences of culture in floodplain management of the case studies from a diachronic perspective

Rationales and framework for the analysis in Part III

Part III carries the findings derived from the analysis in Part II forward to analyse whether culture is a significant factor influencing planning practices and spatial development outcomes. It consists of two chapters, which examine relationships between cultures, planning policies and territorial management outcomes from two different perspectives - a synchronic and diachronic perspectives.

In Chapter 8, the analysis is based on an analytical framework from a synchronic perspective. The synchronic perspective provides the foundation of culture-development relationships at a particular point in time, assuming constant conditions with a static point of view. It refers to Component B in the integrative framework (see Section 3.2). The analysis from this approach aims at understanding in the ways in which culture affect decision-making and development outcomes under a certain policy framework at a given point of time. This is done through an investigation of whether the selected management policies applied in the case studies, which correspond to seemingly common management types, were similarly responded by the locals in different settings. It also analyses whether culture plays a significant role in shaping those similar and different responses towards policies.

Chapter 9 deals with a broader scope of analysis from a diachronic and relational perspective, which refers to Component C in the integrative framework (see Section 3.2). This perspective examines the interplay of culture and development outcomes and changing development conditions over time (i.e. a dynamic relationship). The results regarding persistence and changes of territorial management outcomes over time (as derived from the analysis in Chapter 7) are compared with the analysis of the evolution of cultural values and planning policies in the case studies. The analysis that takes into account the evolution of these elements is carried out in order to identify the elements or conditions influencing planning practices and spatial development outcomes and whether these elements or conditions are closely related to cultures.

Figure 60 shows how these chapters are parts of the analysis base on the integrative conceptual framework developed in this study. It is useful to use both perspectives for the empirical investigation. This is because the synchronic framework of analysis offers a simple way to look at relationships between culture and territorial management outcomes. The framework assumes a stable state of culture and analyses its influences only at a certain period of development. By connecting analyses of situations in different periods of development, dynamic relationships between culture and other development conditions as well as their influences in decision-making processes and

on management outcomes can be seen and understood more simply through the use of the diachronic framework for analysis. The analysis based on findings of these two perspectives is expected to contribute to a better understanding of the relevance and significance of culture in territorial management processes and its implications for design and implementation of spatial planning policies. These contributions and their possible uses in public policy analysis in relation to territorial management are concluded in Part IV.

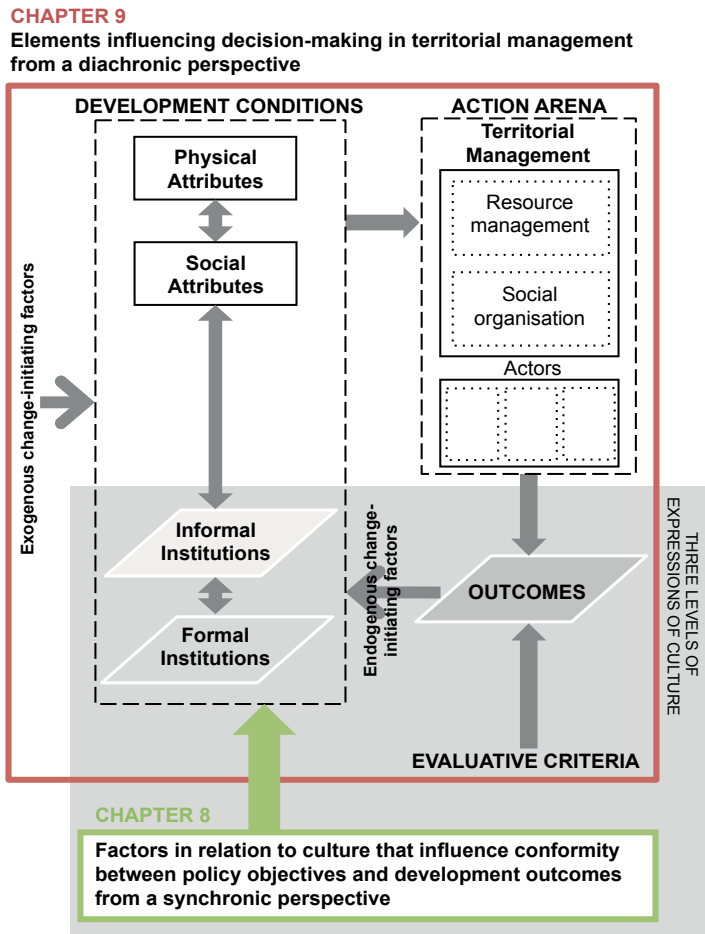

Figure 60
Framework of the analysis in Part III

8 Influences of culture in floodplain management of the case studies from a synchronic perspective

As elaborated in Chapter 6, the water management administrative structures and policies in relation to floodplain management that operated during the twentieth century in the two delta regions studied seem to share several common characteristics. These common characteristics refer to the 'fighting against nature' approach in resource management (corresponding to the anthropocentric management approach) based on technocratic determinations and bureaucratic hierarchies in the management of water and territory (corresponding to the 'hierarchical' type of social organisation). However, different responses towards this seemingly common management approach in the two regions were observed (see Chapter 7). The different responses refer to spatial development patterns and management measures undertaken to cope with flooding in the two regions.

This study argues that these different responses partly resulted from the different degrees of 'conformity' between the policy content and the local cultures of the case studies. This argument is based on the premises framed by a synchronic perspective of the conceptual framework proposed in this study. They are underpinned by a set of factors related to culture presuming to have significant influences on territorial management outcomes, which include both planning practices and spatial development outcomes. This synchronic analytical framework refers to component B in the integrative framework (see Section 3.2 for the overall conceptual framework). In this approach, a stable state of development conditions, including culture, is assumed. In other words, this chapter investigates the relationships between cultural values, planning policies and the territorial management outcomes and examines whether the policies corresponding to the 'fighting against water' management approach were accepted by actors in practice. It also examines whether culture is a significant element contributing to the (non-)conformity between policies and outcomes.

Figure 61 summarises the implications of the set of factors suggested by the conceptual framework for the analysis of policy acceptance in practice. These factors are adapted from Gullestrup's (2006) theory of culture, concerning factors influencing the probability of culture change (see Section 2.2.3 for a detailed explanation of Gullestrup's theory). For the extended description and the methods for the analysis, see Section 3.4.

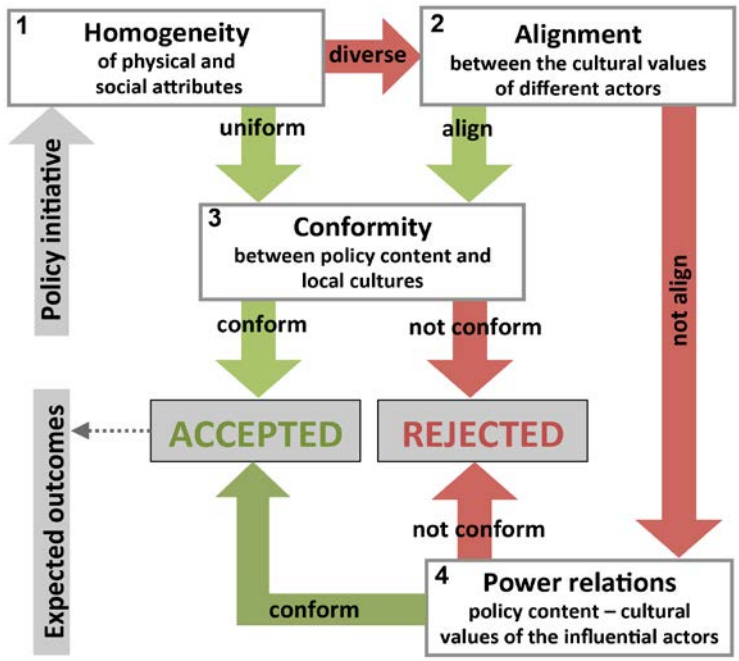

Figure 61
Factors determining the acceptance of policy in practice proposed in the framework for analysis from a synchronic perspective

The framework above presumes that the more management approaches of the formal management authorities and their policy contents conform to local cultures, the higher the tendency that a policy will be accepted and the higher the probability it will result in expected outcomes as aimed for by policy objectives (referring to factor 3 in the above diagram). The term 'local cultures' here refers to the expressions of cultural traits at the constitutional level. It includes the fundamental world views and normative values adopted by a society, which are called 'informal institutions' in this study. This presumption regarding the significance of conformity in determining policy acceptance applies to the conditions in which uniform culture exists in the society analysed. The framework also presumes that the existence of uniform cultures is more likely in places where physical and social attributes are homogeneous (referring to factor 1). Yet, the framework addresses also that in the cases that physical and social attributes are not homogeneous, the society may develop diverse management cultural traits. These cultural traits may or may not be aligned (referring to factor 2). In cases that they are not aligned, internal power relations (referring to factor 4) are likely the determining factor for policy acceptance in practice. It means that if the management approaches present in the policy contents conform to the cultural traits of the most influential actors in territorial management processes, policy acceptance in practice could be expected.

8.1 Comparison of the 'fighting against water' type of policies in the two delta regions

The 'fighting against water' management approach has been present in territorial and water management policies and practised in the Rhine-Meuse delta region for centuries. This is considerably different from the situation in the Chaophraya delta region, where the 'fighting against water' policy approach has become evident only in the twentieth century. It was observed in this study that management policies regarding flood-related issues employed by the public sector in the two delta regions during that century share common characteristics. These characteristics include water management practices based on hydrological engineering solutions suggested by experts and operated under the centralised sector-based authority for collective benefits. Table 11 summarises the scrutinised attributes of the policy for this analysis.

Planning policy	Launched	Organisations	Objectives	Measures
Policies/programmes in the Rhine-Meuse delta region				
Land reclamation and development as polder	13th Century	Water boards	to manage water and protect the enclosed territory from floods	dike rings and canal systems
Development based on the flooding probability principle and Delta Works	1958 (Delta Laws)	Deltacommissie launched, Rijkswaterstaat and water boards executed	to protect and drain the land from getting brackish and flooded	dikes, sluices
Policies/programmes in the Chaophraya delta region				
Land reclamation through canalisation	late 19th century	State launched, private enterprises executed	to dry and convert unattended land for cultivation	canal systems
Flood control from upstream by dams	1960s	King Rama IX's initiative, RID and BMA executed	to manage water mainly for agricultural purposes	dam, reservoir, embankments and irrigation canals
The King's Dike to protect the core urban area	1983 (initiated)	King Rama IX's initiative, Department of Highway executed	to prevent the core urban area on the east of Bangkok from floods	dikes, ring roads
Regional water management proposals	1980s	Planned by external (foreign) experts	to manage excessive water at the regional scale	water diversion channel

Table 11
Summary of the 'fighting against water' policies for the analysis

Despite seemingly similar policies regarding their resource management approach, the policies above were associated with variations regarding social organisation types. Planning policies in relation to the management of floodplains applied in the two delta regions before the twentieth century were associated with a more symmetrical transaction approach to social organisation than the policies launched in the twentieth century. The main difference between land reclamation and development with the polder system in the Dutch case and the land reclamation through canalisation projects in the Thai case was the degree of collectiveness present in the policies. In the Thai case, the policy corresponded to the individualised management approach, as the projects were carried out by private concessionaires who were granted for land ownership on both sides of the canals (Molle 2005). On the other hand, the management approach of the water boards in the Dutch case corresponded more to the collectivised approach that also incorporated individual interests in management practices (Hooimeijer *et al.* 2005; Ostrom and Janssen 2004).

There were also substantial differences between the policies launched in the twentieth century in the two regions. The social organisation approach underpinning the Delta Laws in the Dutch case was based on processes of negotiation and coordination between different sectors across levels of management, from national, regional, provincial to municipal levels (Hooimeijer *et al.* 2005; Stive and Vrijling 2010). These processes aim to derive consensus and consistency in management at all scales (see Section 6.1 for further explanation). This social organisation approach corresponded to a considerably lower degree of power distance in the Dutch policy approach than that of the Thai case. In the Thai case, it is evident that participation of other sectors of society other than the public authorities in the processes of planning and implementation was rather limited. In addition, most of the plans and projects were developed based on either the suggestions given by foreign experts or King Rama IX's initiatives (see Section 6.2 for examples and further explanation). This presents the important roles of other actors/institutions aside from formal institutions in the making of territorial management policies and plans in the Thai case. The differences regarding social organisation approaches of the two case studies are argued here as having significant influences on the policy implementation and the management outcomes. These influences are explained in the following sections.

8.2 Relationships between culture, planning policy and acceptance of a policy in practice

The conceptual framework developed in this study presumes that there is a strong relationship between culture, planning organisations and policies, and territorial management outcomes. The more conformity between the management types present in the predominant cultural traits and the planning organisations and policies, the higher the chance that the policy will be accepted in practice. This section examines whether this fundamental rationale in the conceptual framework helps explain the different degrees of acceptance in practice of the selected management policies in the two delta regions studied.

8.2.1 'Conformity' regarding resource management aspects

As elaborated in Chapter 5, the predominant cultures regarding floodplain management in the Rhine-Meuse delta region strongly correspond to the 'controlling of nature' type of resource management. It means that the Dutch tend to have values towards water control in order to avoid uncertain situations rather than to adapt human's behaviours to be in harmony with nature. This is remarkably different from the core values regarding floodplain management of the Chaophraya delta region, which correspond to the 'living with nature' type of resource management. In the Thai cultural context, people tend to accept uncertainty potentially created by floods and adapt their behaviours rather than try to control nature. In this study, it is argued that the difference between these two distinctive cultural values have significant influences on shaping the different actions in response to the 'fighting against water' management policies in the two delta regions.

The analysis of the spatial development of the Dutch case in Section 7.1 reveals that the 'fighting against water' management approach has been predominantly practised in the Rhine-Meuse delta region by all sectors since the thirteenth century (Meyer 2010; Stive and Vrijling 2010). This was presented in the form of expansions of urbanised areas into naturally flood-prone areas, along with the provision of advanced hydraulic engineering solutions for preventing the areas from flooding. This pattern of urban expansion implies the existence of floodplain management practices in which man-made flood preventive measures were employed to control problems and minimise uncertain situations that might result from floods in the settlements. This floodplain management approach practised in the Dutch delta region corresponds to the 'controlling of nature' type of resource management, which has been also predominant in the Dutch conceptions of the human-nature relationship. This

management approach conforms also to the content of the 'fighting against water' policies. According to the principle of 'conformity' in the conceptual framework, the spatial development patterns presenting positive responses towards the 'fighting against water' policies in the Rhine-Meuse delta region were significantly influenced by the conformity between the policy content and the predominant cultural traits in relation to floodplain management in the Dutch development context.

The rationale above regarding 'conformity' applies also to floodplain management in the Chaophraya delta region, but in the opposite way. Since the twentieth century, significant changes of the planning policies towards the more 'controlling of nature' type of resource management were observed (see Section 6.2.2 for further detail). However, the analysis of spatial development patterns and management measures to cope with extreme floods in the past in the Chaophraya delta region shows the strong influence of the 'living with nature' type of resource management. This was expressed in the form of measures that people employed during the flooding events in the twentieth century, as elaborated in Section 7.2.3. It was also expressed in the concentration of settlements before 1986 in the areas that are less prone to floods than in the areas that are highly prone to floods. The management practice corresponding to the 'living with nature' type of management was particularly predominant amongst the local citizens. It did not conform to the 'fighting against water' management approach present in the planning policies for the region. According to the principle of 'conformity', the non-conformity between the 'fighting against water' policies and the floodplain management practised in the Chaophraya delta region was the result of the non-conformity between the predominant cultural traits regarding floodplain management and the policy content in the Thai development context.

According to the interpretation of cultural values carried out in Chapter 5, these predominant cultural traits in both case studies correspond to the fundamental world views present in the predominant religion, languages and rituals traditionally practised in each region. The 'controlling of nature' type of resource management conceptions in the Rhine-Meuse delta region is analysed in Section 5.1.1 as having a strong relationship with the Christian world view on human-nature relationships. The analysis in Section 5.2.1 also shows strong relationship between the 'living with nature' type of resource management and the conceptions of the human-nature relationship present in the Buddhist world view, animist beliefs, Thai language and the relevant rituals. Although these traditional normative values seem to have evolved over time in both case studies (see Chapter 5),[20] the influence of new or evolving values on the planning practices and development outcomes were rather limited (see Chapter 7 for further

20 The analysis of various sources of evidence shows recent changes of values regarding resource management more towards the 'social-ecological integration' approach (with a high degree of nature integration) in the Dutch case. For the Thai case, it shows slight changes towards a higher degree of control of problems in order to reduce uncertain situations possibly created by floods.

explanation). Yet, the strong influence of the traditional core values were observed in development of both regions. According to the observations above, it is presumed here that traditional core values are likely embedded in the society and are manifested as cultures. These cultures essentially underpin decision-making processes and influence territorial management outcomes.

In summary, the analysis above shows the validity of a fundamental rationale in the conceptual framework in relation to the principle of conformity between cultures, planning policies and territorial management outcomes (referring to factor 3 in the framework used in this chapter). It implies that acceptance of a policy in practice is likely if the management approaches present in local cultures and the policy content are conforming. The conformity between local cultures and policy contents would then likely result in planning practice and development outcomes that planning objectives aim for. It also reveals the strong relationships between cultural traits and the traditional core values present in the dominant religion, languages and rituals.

8.2.2 'Conformity' regarding social organisation aspects

The narrative above depicts the response to the 'fighting against water' policy approach in general. Yet, the analysis in Chapter 7 reveals that the responses to some specific 'fighting against water' policies were distinctive from the others. This was observed in floodplain management practices in both delta regions. Additionally, the analysis at the sub-national level shows that there were variations regarding responses to the similar types of management policies in different districts in the Chaophraya delta region. An example illustrating these differences is the success in implementing the collective-based 'fighting against water' management programme during the 2011 flooding event in Pak-kred District ("Pak-Kred Model" 2011) and in a neighbourhood in Lam-look-ka District (Interviews with the Local Residents 2012). These two examples present positive responses towards the policy, opposed to the failure to carry out a similar water management measure by the competent public authorities at the regional scale (see further explanation in Section 7.2.4).

These examples reveal that the acceptance of policies in practice may occur even in the case that the resource management type present in the policy does not conform to the local culture. This may occur if conformity regarding social organisation types between the policy and the local culture exists, like in the two specific neighbourhoods in the Thai case. More precisely, various studies, such as Rigg (1995), have reported the strong role of informal sectors, such as monks, students and NGOs, with anti-state perspectives in the environmental management in Thailand. This refers to the Thai form of social organisation, in which collective tasks are achieved through reciprocity

and obliging of people in the community rather than through the assistance of the state.

This social organisation culture has played crucial roles in explaining variation in the management practices across the Chaophraya delta region. Based on the principle of conformity proposed in the conceptual framework, it is argued here that the non-conformity between the 'hierarchical' social organisation approach led by the state and the individualised type of culture regarding social organisation in the context of environmental management in Thailand is likely the crucial factor contributing to the failure to implement the collective-based 'fighting against water' management approach at the regional level. On the other hand, the success of implementing a similar management measure in the two aforementioned districts was underpinned by the conformity between the local culture and strategies for implementing the management measure. These strategies refer to the management in which informal institutions (such as temples and committees in gated communities) along with a respected or strong leader play a significant role in the processes of negotiation and implementation (see Section 7.2.4 for further explanation).

Another example of the influence of 'conformity' regarding social organisation approach on the policy acceptance in practice was the opposition to and limited support given to the centralised water management of the Rijkswaterstaat and its water management projects before the twentieth century in the Dutch case. Before recent policy changes towards a new water management vision in the beginning of the twenty-first century, the management policies and projects applied in the Rhine-Meuse delta region corresponded to the 'fighting against water' management approach (see Section 6.1.2). These policies and projects were planned and executed either by the Rijkswaterstaat or water boards. Nevertheless, the policies and projects under the Rijkswaterstaat's responsibility had not been supported by the public as extensively as those launched by water boards (Reinhard and Folmer 2009).

Based on the principle of conformity, the opposition to and limited support of the policies and projects implemented by the Rijkswaterstaat mentioned above were the result of non-conformity between the policy content and the culture regarding social organisation in the Dutch context of floodplain management. This culture refers to the collective form of management approach associated with a high degree of symmetrical transaction and individual interests are inclusive (see Section 6.1.1 for further explanation). Although the Rijkswaterstaat and water boards share common characteristics of rational management informed by the best available expertise to optimise the collective benefits, they are associated with key distinctions regarding social organisation approaches.

The administrative structure and the policy approach of water boards highlight the processes of getting consensus amongst the actors with individual interests through

'democratic pragmatism' (Zonneveld 2010; Hendriks and Buntsma 2009). This social organisation approach conforms to the aforementioned core values of Dutch society and is argued as resulting in the positive responses towards the implementation of the policies and projects of the water boards. On the other hand, the administrative structure and the policy approach of the Rijkswaterstaat corresponds to the rather centralised authoritative characteristics in management with the service of a clearly defined public interest ("Rijkswaterstaat" n.d.; Hendriks and Buntsma 2009). This form of social organisation associated with a considerably high degree of power distance did not conform to the core values and resulted in opposition to and limited support for the policies and projects implemented by the Rijkswaterstaat.

However, the degree of acceptance has remarkably changed after the catastrophic flood in 1953 (Reinhard and Folmer 2009). This was evident in the extensive public support for the Delta Works in the latter half of the twentieth century. Yet, this change in the acceptance of projects under the Rijkswaterstaat is argued here as being the result of the public realisation of the need for centralised authority and national policies and projects for water management. This is in order to improve the efficiency of the existing water management and flood prevention system to a larger scale than what water boards could manage (see Section 6.1.2 for a detailed explanation).

This example reveals the dynamics of culture regarding floodplain management and their effects on planning practice. There are several other examples elaborated in Part II that present the dynamics of culture and their likely effects on territorial management processes. These include, for instance, the redesign of the Oosterschelde closure in the Dutch case (Hooimeijer *et al.* 2005; Bijker 2002) and the recall for floodway projects after the 2011 flood in the Thai case (Reumvieng 2011). The evidence of dynamics of culture highlights the significance of understanding the processes of cultural changes regarding the driving factors of changes and their impacts on planning practice. These issues are further elaborated in Chapter 9, using a framework for analysis from a diachronic perspective.

8.3 Role of 'internal power relations' on acceptance of a policy in practice

The analysis at the cross-national level in the previous section reveals strong relationships between the management types present in policy content, cultural traits and outcomes regarding floodplain management in the two case study regions. However, the analysis at the sub-national level reveals the variation of management approaches practised in the three districts within the Chaophraya delta region. In general, changes towards a more 'anthropocentric' approach were observed in

floodplain management practised in all districts, especially in the twenty-first century (see Section 7.2). Yet, the degree of changes occurred in each area is different. Changes were more evident in newly urbanised areas (taking place around the turn of the twentieth-first century) as opposed to areas that were urbanised in the early twentieth century or earlier.

The sub-national analysis of spatial development patterns in the three districts in Section 7.2.4 shows that the spatial development patterns in Khlongluang were associated with a lower degree of nature integration than those in Bangkoknoi-Talingchan. Based on the conceptual framework developed here, the variation of management practices across districts possibly illustrates influences of the different predominant cultural traits regarding floodplain management in these districts. The fundamental rationale underlying this argument is namely that in cases that a community consists of diverse groups of actors, each group may have different cultural traits regarding the management of flood-related issues. If these diverse cultural traits are not aligned, the 'internal power relations' (i.e. factor 4 in the diagram) are the decisive factor for policy acceptance. In other words, it presumes that the more conformity between the management approach of a policy and the cultural traits of the most influential actors in the decision-making processes, the higher chance that policy acceptance in practice can be expected.

This rationale helps explain the variation of floodplain management practices across the Chaophraya delta region. In the case of the three districts, the most influential actors in territorial management processes in each district are different groups of actors; and these different groups of actors have different values regarding management of flood vulnerable areas. The different cultural traits then resulted in differences in planning practices and development outcomes in different districts. In other words, floodplain management measures practised in each of the three districts was underpinned by different cultural traits attached to different groups of influential actors.

In addition to the evidence above, the analysis in Section 7.2.4 also shows that the distinctive spatial development outcomes and measures employed to cope with flooding in different districts strongly relate to the group of actors who are most influential in territorial management processes. This is especially evident when the situations in Bangkoknoi-Talingchan and Khlongluang are compared. It was observed in this study that most of the land in Bangkoknoi-Talingchan is owned by individual households. Here, citizens are the most influential actors in territorial development processes. The spatial development patterns in Bangkoknoi-Talingchan correspond to a rather high degree of nature integration (see Section 7.2.4 for further detail). This is evident in its land development patterns, in which land is mainly occupied by mixed-uses of agricultural and residential activities with relatively low-density of development (DPT 2006; DOL 2009). On the contrary, spatial development patterns

in Khlongluang corresponded to a rather low degree of nature integration. Most of the land development projects here were large-scale development for industrial, residential and commercial activities (DPT 2006; DOL 2009; Askew 2003; Ouyyanont 2000; Molle 2005). Urbanisation in this naturally swampy area was mainly initiated by private developers, with support from the public sector mainly through infrastructure provisions (Srisawalak-Nabangchang and Wonghanchao 2000).

A higher degree of nature integration in land development of Bangkoknoi-Talingchan than in Khlongluang was also observed from the measures taken to cope with flooding in the two districts. Evidence of this is the existence of the 'living with nature' type of measure in Bangkoknoi-Talingchan, such as houses on stilts (Jumsai and Buckminster Fuller 1988; Nontnart 2011), the ways people in Bangkoknoi-Talingchan adapted their daily lives to the tides during the 1995 flooding event and the high proportion of blue and green networks in the new housing projects (see Section 7.2.3 and Section 7.2.4). On the contrary, housing projects in Khlongluang were developed with high-density and a considerably low proportion of blue and green networks. A very high quantity of landfills was commonly employed here to prevent the low-lying land from being flooded (see Section 7.2.4). These measures and spatial development patterns show not only a lower degree of nature integration, but also a lower degree of acceptance to uncertain situations in territorial management of Khlongluang than Bangkoknoi-Talingchan.

In short, the analysis at the sub-national level reveals strong correlations between the most influential actors and territorial management outcomes. However, these relations are apparent with regard to the uncertainty avoidance dimension only; correlations with regards to the nature integration dimension are not very clear. It means that a high degree of acceptance of uncertain situations possibly influenced by floods was present in both the cultural traits and the management outcomes in Bangkoknoi-Talingchan; and a low degree of uncertainty acceptance was also present in both the cultural traits and management outcomes in Khlongluang. Yet, the interviews do not show significant differences between the local cultures regarding nature integration dimension amongst the three districts as it does in the management practices. This implies that there are factors other than cultures that influence territorial management outcomes, which include both planning practices and spatial development outcomes. This issue is examined further in Chapter 9.

8.4 Relations between physical attributes and cultures

One of the premises underlying the conceptual framework developed in this study is that there is a strong relation between the uniformity of cultural traits regarding

territorial management and physical and social attributes (i.e. factor 1 in the diagram). In the specific context of floodplain management, physical and social attributes refer to attributes with regard to degree of flood risk of the area. The conceptual framework presumes that areas associated with a uniform degree of flood risk are likely to result in a society with a uniform culture in relation to floodplain management. On the other hand, areas associated with diverse degrees of flood risk created by diverse physical and social attributes are likely to result in diverse cultural traits in relation to floodplain management. These diverse cultural traits may not be as aligned as a uniform culture. This section examines whether this rationale suggested by the conceptual framework is empirically valid.

Most parts of the Rhine-Meuse delta region are highly prone to flooding and naturally uninhabitable (Meyer *et al.* 2010). The potential damages created by floods in the region are considered greatly hazardous to all types of land use (see Section 4.3.1 for further explanation). Urbanisation processes on these naturally uninhabitable land would not be possible without development of flood defence measures, such as drainage and dike construction technology (Meyer 2010). These measures are necessary to reclaim land and to keep the settlements be protected from floods. In other words, a high degree of flood exposure and hazard in the region creates the conditions in which advanced technology for flood defensive measures is crucial. The construction, maintenance and management of these measures would be ineffective or even impossible without the collective organisation and cooperation of people with different interests (Zonneveld 2010).

The characteristics above of the land and flooding in the Rhine-Meuse delta region are considerably different from those of the Chaophraya delta region. Despite the fact that the Chaophraya delta region is naturally prone to floods, a large part of the region is suitable for cultivation and settlements. These areas are suitable for land development experience floods only occasionally, and the degree of flood hazards is rather low (see Section 4.3.2). However, the characteristics of land and flooding are not shared throughout the whole region. Some parts of the region were naturally highly prone to floods and less suitable for land development than the others. Without any interventions, these highly flood-prone areas may experience long periods of inundation annually as well as regular periods of inundation due to locally intense rainfalls during the monsoon period (see Section 4.3.2).

Regarding planning practices and spatial development outcomes, different degrees of uniformity in the cultures in each of the two regions studied were also observed. In the Rhine-Meuse delta region, uniform practices and outcomes corresponding to the 'controlling of nature' type of resource management based on the collectivised approach in social organisation were observed (see Section 7.1). On the other hand, diverse management approaches were observed in the practices and development outcomes of different parts of the Chaophraya delta region. Using the proposed

framework to explain this, the rather uniform practices in the Dutch case is related to the fairly uniform characteristics of the land and flooding in the region (based on factor 1 of the conceptual framework shown in the diagram). This uniformity resulted in uniform cultures regarding floodplain management across the region.

Based on the same rationale, the diverse practices and development outcomes in the Thai case are argued as relating to the diverse characteristics of land and flooding across the region. The relatively low flood risks in the Chaophraya delta region create conditions in which flood prevention and collective management approaches are not as obligatory as it is the case in the Rhine-Meuse delta region. As a result, people living in the areas associated with a low degree of flood risk tend to react in response to flood issues with the 'living with nature' resource management approach and the individualised-based social organisation approach. On the contrary, the 'controlling of nature' type of water management is more commonly practised in the areas associated with a higher degree of flood risk. The evidence above implies that the diverse characteristics of land and floods across the region are likely to contribute to the diversity of local cultures and different planning practices and development outcomes regarding floodplain management in the different districts.

In summary, the evidence above validates the premise regarding relations between the degree of flood risk created by physical and social attributes of the area and the degree of uniformity of cultural traits regarding floodplain management (factor 1). The empirical findings show that the areas associated with a uniform degree of flood risk are likely to create uniform cultures regarding floodplain management in a given territory. On the other hand, diverse degrees of flood risk created by diverse physical and social attributes of the territory/society are likely to result in diverse cultural traits relating to floodplain management, which may also not be aligned as a uniform culture.

Nevertheless, it should be noted that these observations regarding uniform cultural traits in floodplain management of the Dutch case and diverse cultural traits in the Thai case do not conform to the degree of uniformity of core values between the two cases as interpreted from selected parameters of the World Value Survey (WVS) and Hofstede's survey (see Chapter 5 for further explanations about interpretations of core values). This non-conformity is probably a result of the greater influence of physical attributes over core values in determining floodplain management practices. To put in simple terms, local physical conditions may form cultural traits that are different from the general core values of a given society. This presumption is further elaborated in the next chapter, using the institutionalist framework for analysis that takes into consideration the possible influences of multiple development conditions on decision-making in territorial management processes.

8.5 Summary and remarks: influences of cultures on planning practice and spatial development outcomes from a synchronic perspective

The analysis of the responses of different actors to the 'fighting against water' policies in the case studies helps partially explain why a policy is accepted or not accepted in practice and what are the factors underpinning acceptance. This provides a better understanding of the relationship between culture and planning practice and raises awareness amongst planners regarding the significance of culture in policy making and implementation, in order to promote outcomes that planning objectives aim for. The application of the conceptual frameworks indicates that the conceptual framework from a synchronic perspective appears applicable in explaining the relevance of culture in territorial management processes in the case studies, especially regarding effects on planning practices. It reveals two significant points in relation to the key factors proposed in the framework.

First, it shows evidence that validates one of the fundamental premises of the conceptual framework, namely that the more conformity between the management types present in local cultures and the policy content, the higher chance the policy will be accepted in practice. This finding provides support to the importance of 'conformity' between policy content and local cultures for enhancing the policy transferability addressed in previous studies, such as de Jong and Mamadouh (2002) and Marsden and Stead (2011).

Moreover, the analysis adds to a better understanding of previous studies in relation to the degree of importance of 'conformity', which can be various in different conditions. Application of the framework suggests that planning practices in the case studies were primarily influenced by the degree of conformity regarding the social organisation type. In cases in which the social organisation of the policy contents and the cultural traits do not conform, then the conformity regarding the resource management type becomes crucial in determining policy acceptance in practice. In other words, the analysis suggests that in order to promote policy acceptance in practice, special attention and concerns regarding the conformity of local cultures and policy contents in the processes of design and implementation of a policy are essential. The conformity is especially crucial in regards to social organisation cultures. How attention to local cultures could be used to improve implementation of current policies in the case study areas are exemplified in Chapter 11.

Second, the application of the framework at two levels of analysis reveal that physical conditions in relation to the degree of flood risk of a area have a strong correlation to planning practices and development outcomes. In the areas in which the degree of flood risk is rather uniform across the territory, people tend to employ a common approach to floodplain management. On the contrary, areas associated with different degrees of flood risk provide possibilities for people to react to policies differently

according to their cultural traits. In cases of the areas with diverse degrees of flood risk in which a community comprised of diverse groups of actors whose cultural traits regarding floodplain management are not aligned, the 'internal power relations' are the decisive factor for policy acceptance in practice. The more conformity between policy contents and the cultural traits of the most influential actors in decision-making processes, the higher chance that content policy acceptance in practice can be expected. This is evident in the case of planning practices and spatial development outcomes in the Chaophraya delta region, which are rather diverse in different areas.

The implication of this point for planners is that in areas associated with diverse physical and social attributes, it is essential to give special attention to the local conditions in the territorial management process, especially regarding the social organisation model that is currently in use. Additionally, these findings validate the presumption of the applicability of the four factors suggested by Gullestrup (2006) as significantly influencing the probability of culture changes to explain floodplain management issues, as proposed in this work.

Nevertheless, these findings are based on the application of the framework from a synchronic perspective, which provide rather limited understandings of culture and its influences in territorial management processes. In the next chapter, an empirical investigation from a diachronic perspective is carried out in order to further expand the understandings of culture derived from the analysis in this chapter. This is done by including dynamic and relational dimensions of culture in relation to other development conditions in the investigation of floodplain management in the case studies. The findings and remarks derived from the two perspectives of analysis are then combined and the implications of interrelationships between culture, planning policy and territorial management outcomes for spatial planning are concluded in Part IV.

9 Influences of culture in floodplain management of the case studies from a diachronic perspective

The analysis that applies the framework from a synchronic perspective in Chapter 8, in which a stable state of culture is assumed, shows that the principle of 'conformity' between management culture and the policy content helps explain floodplain management practices in the case studies at a given point in time. However, there are still issues that are relevant for developing a better understanding of the roles of culture in spatial planning, but which cannot be explained using a synchronic perspective of analysis.

Analysis carried out in the previous chapters reveals that cultures, planning policies and territorial management outcomes in the case studies have evolved over time. The analysis points to a variation of the factors triggering these changes in case studies during different situations. For instance, there were changes in values in both regions that were triggered by great damages resulting from flooding disasters. There was also evidence of changes in cultural values that were influenced by environmental discourses in the Dutch case and by transfers of technology and policies in the Thai case. This chapter investigates *which kinds of change-initiating factors have crucial impacts on triggering institutional adaptation and influence floodplain management outcomes?* Institutional adaptation here refers to (i) changes in planning regulations and procedures (formal institutions) and (ii) changes in cultural traits in relation to floodplain management (informal institutions). The investigation emphasises the following issues:

- Did changes in culture affect planning policies and floodplain management practices?
- Did changes in formal institutions play a significant role in the shaping of floodplain management practices?
- Did spatial development outcomes lead to institutional adaptations?

The term 'floodplain management practices' here refers to all activities, management measure and procedures undertaken by actor involved in territorial management in relation to flood-related activities. It also includes spatial development patterns resulting from those activities.

In addition to the issue of interrelationships between culture, planning policy and territorial management outcomes, it is also important to develop understandings of the variation in cultural traits and floodplain management practices across territories in which common institutional frameworks are assumed. This is an issue evidently shown from the analysis of cultural traits, planning policies and management outcomes (i.e. floodplain management practices) in the Chaophraya delta region at the sub-national level. The findings from the analysis in Part II brought up the question of '*were the differences in floodplain management practice also influenced by other elements rather than the common institutional framework, which is shared by all districts in the region?*' The other elements here refer to social attributes and physical conditions of the areas as defined in the proposed conceptual framework (See Section 3.5). These aspects are relevant for this study because unveiling these aspects may help raise awareness amongst planners about the possible influences of local preconditions on policy implementation and planning practices. This applies not only when a policy is transferred from other countries, but also regards to the implementation of a similar policies in different locations within the country or a region.

The above questions are argued here as can being better understood by the analysis using a conceptual framework based on a diachronic-relational perspective. This framework is adapted from the Institutional Analysis and Development (IAD) framework (Ostrom 2005b). It engages the analysis of multiple elements that are argued in the conceptual framework as being interrelated. The conceptual framework using this perspective is underpinned by two fundamental principles: (i) interrelationships between development conditions (which include culture) and (ii) dynamics of these conditions for development. These issues are important to understand the relationships between culture, planning policy and territorial management outcomes in a dynamic context of development.

A better understanding of these issues would help raise awareness amongst planners and policy makers of the significance of culture and inform how culture could be taken into account in planning processes, so that desirable outcomes aimed for by planning objectives can be expected. It also helps inform how the possible consequences of spatial interventions and planning policies can help shape people's perceptions and values regarding floodplain management. This is a significant contribution to spatial planning, as it may help reduce undesirable consequences created by planning policies and actions.

Figure 62 shows relations of the components within the conceptual framework used in this chapter for analysis from a diachronic perspective. The framework consists of three fundamental components – (i) development conditions that influence actions, (ii) action arena and (iii) outcomes (see Chapter 3 for the extended explanation of the framework and the methods for the analysis). It presumes that decisions are made based on development conditions, which are formed by four fundamental development conditions. The four development conditions are listed below.

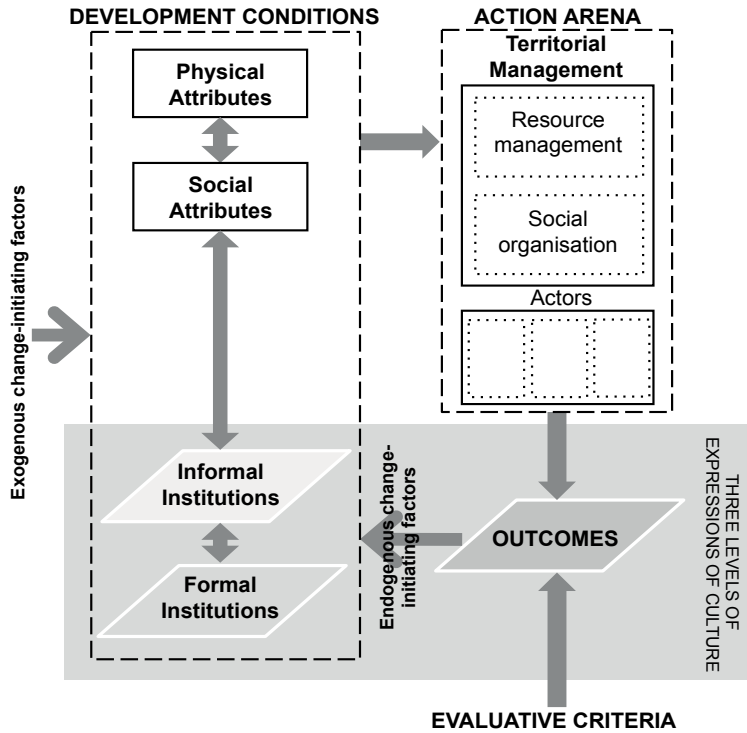

Figure 62
The conceptual framework showing the relationships between development conditions, actions and outcomes in the processes of floodplain management
Source: Adapted from Ostrom's (2005b) Institutional Analysis and Development (IAD) framework

- 'Physical attributes' refer to characteristics of water, land and spatial development patterns in relation to flood risk.
- 'Social attributes' refers to attributes (such as religion and socio-economic conditions) that influence the behaviours of people in the society, either at the individual or collective levels.
- 'Informal institutions' refer the non-legitimised forms of institutions, including values, believes and worldviews of actors.
- 'Formal institutions' refer to the competent authorities and the laws, regulations, policies and plans.

These development conditions are interrelated and dynamic. Together, they create a framework in which decisions are made and actions take place. These decision-makings and actions are referred to in this framework as outcomes. These outcomes, in turn, have effects on development conditions. Actors evaluate the outcomes and craft rules (either formal or informal ones) through institutional arrangements to create the institutional conditions by which the desirable outcomes can be expected. In other words, planning policies and floodplain management practice are results of iterative processes of decision-making constituted by dynamic interactions between these four fundamental development conditions.

9.1 Evolution of culture, planning policy and outcomes regarding floodplain management in the Rhine-Meuse delta region

The analysis in the previous chapters shows that the management of the Rhine-Meuse delta region has evolved over time. The changes occurred at all levels of expressions, including cultural traits, planning policies and outcomes relating to floodplain management. This section investigates whether the changes of these three elements are correlated. In other words, it examines whether changes at one level of a cultural expression correlates with changes at other levels. It also investigates whether the effects created by a development condition, either exogenous or endogenous ones, were different from effects created by other conditions.

9.1.1 Changes in relation to aspects of resource management

Figure 63 illustrates the significant changes in floodplain management in the Rhine-Meuse delta region regarding the resource management aspects at each level. It shows three important points that are relevant for the analysis from the diachronic perspective, as elaborated below.

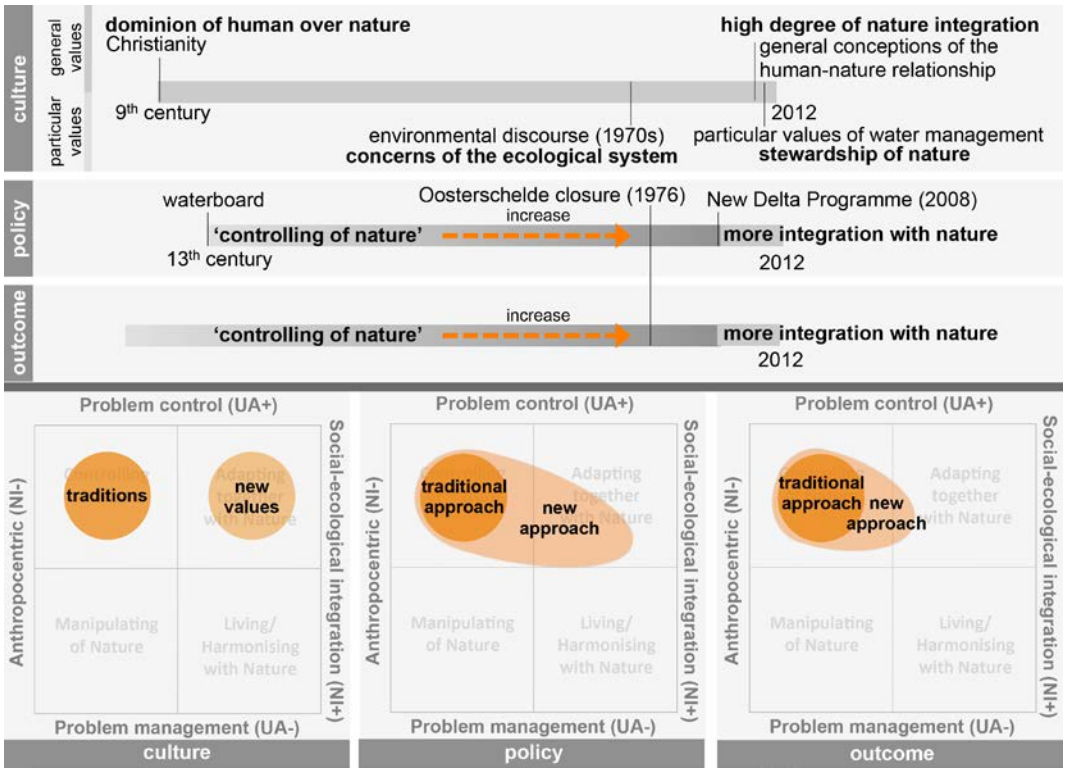

Figure 63
Changes of the floodplain management approaches regarding resource management in the Rhine-Meuse delta region

(I) Increases in the degree of control over nature

In the Rhine-Meuse delta region, increases in the degree of the control over nature approach in floodplain management over time have been observed both in planning policies, actions and in management outcomes. Evidence of this trend within the planning policies and actions was the increasing degree of advancements in hydraulic engineering technology employed by competent authorities for the planning and development of the region. These advanced techniques included, for instance, mill technology with closed dike systems since the fifteenth century and hydraulic engineering techniques based on mathematical modelling since the nineteenth century (Hooimeijer *et al.* 2005). The evidence of increases in the control over nature model in spatial development outcomes was the accelerated expansion of urban areas into areas with a naturally high degree of flood hazard with robust flood protection (see Section 7.1 for further detail). These increases were apparent from the thirteenth to the twentieth century.

The simultaneous increases in the degree of 'controlling of nature' approaches both in policies and outcomes imply the likely relationship between these two parameters. Based on the conceptual framework proposed in this study, this relation could be explained by how the implementation of policies regarding advanced flood prevention measures have reduced the frequency and effects of flooding in flood-prone areas. It created a new condition for the local land, with a lower degree of susceptibility to floods and changed people's perceptions about the degree of flood risks. This new condition then resulted in the extensive expansion of land development and urbanisation in the region. This suggests that the 'controlling of nature' type of policies have resulted in changes in physical conditions that then affected planning practice and spatial development outcomes.

Furthermore, it is also observed that it was probably not only changes in planning policies that affected planning practice and spatial development outcomes; changes in practice and resultant outcomes may also result in changes in planning and policies. Based on the proposed conceptual framework, it is argued that the increases in land development and urbanisation in naturally highly flood-prone areas were evaluated and resulted in the call for institutional adaptation. The more urbanised flood-prone areas are, the higher the degree of flood risk is; and the higher risk that such areas have, a higher degree of flood prevention is called for. In short, the analysis leads to a preliminary conclusion that the spatial outcomes produced by the 'controlling of nature' type of policies have strengthened the 'controlling of nature' principle in the formal institutions.

These processes of change suggested by the analysis of the Dutch case show the iterative courses of institutional adaptation driven by technological advancements, which is considered as an exogenous change-initiating factor according to the proposed conceptual framework. It shows the likely significant influence of physical conditions on both planning policies and floodplain management outcomes in the Dutch case. This relationship is illustrated in Figure 64. It should be noted that this study is aware of the possible influences of development conditions other than physical attributes, such as improved economic conditions. Yet, as the study aims to develop better understandings of the influence of culture on territorial development and its implications for spatial planning, physical attributes are of particular interest and are emphasised in the analysis.

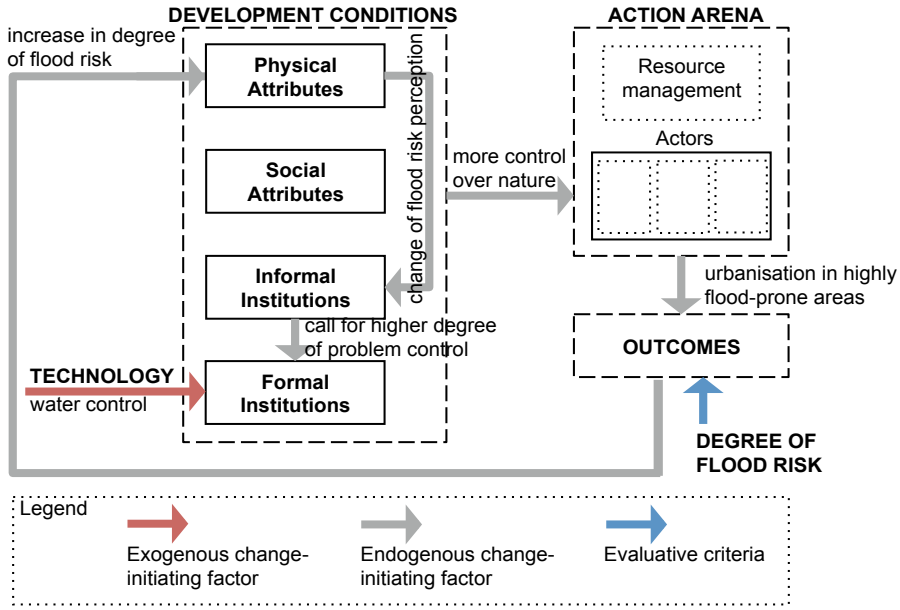

Figure 64
The processes of changes in floodplain management in the Rhine-Meuse delta region triggered by technological advancements

(II) Influences of environmental discourses in the 1970s on the cultural traits, planning policies and floodplain management outcomes in the twentieth century

Despite the aforementioned continuation of the 'controlling of nature' management approach in the twentieth century, recent changes toward management approaches that are better integrated with nature have been observed. This is presented in Figure 63. The figure shows that the changes took place at all three levels of expressions just recently. These changes correspond to the emphasis on environmental concerns brought on by environmental discourses, which have become prominent amongst the public and been influential on the development of the region since the 1970s. Cultural values regarding environmental management derived from the World Values Survey (WVS n.d.) and Hofstede's survey about national cultures (Hofstede 2011) are possibly reflections of the effects of environmental discourses on cultural values. The evidence of effects on Dutch planning policies was the redesign of the Oosterschelde closure in 1976, which allowed salt-water to naturally flow during the normal period for ecological reasons (Hooimeijer *et al.* 2005; Bijker 2002) (see Section 6.1.1 for further detail). Nevertheless, the effects of this cultural change on spatial development patterns were not yet evident in the twentieth century.

The changes above reveal evidence of changes in culture triggered by the introduction of new global discourses, which is, in this study, considered as an exogenous change-initiative factor. It shows that a transfer of ideas from the other places may lead to changes of values, which then influence planning policies and floodplain management practices. This is illustrated in Figure 65.

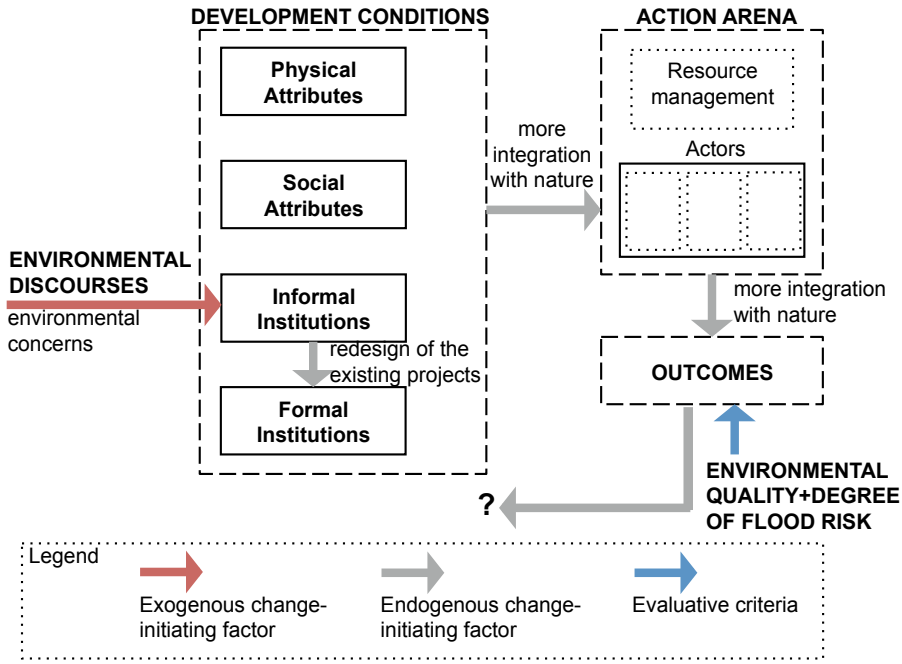

Figure 65
Influences of the environmental discourses on the floodplain management in the Rhine-Meuse delta region

(III) Factors influencing changes in planning towards the 'working together with water' management vision

Apart from the aforementioned changes of policy in the 1970s, there was also a significant change in policy approaches in the twenty-first century. This change refers to the introduction a new management vision, namely 'working together with water', in the national policy agreement for water management in the twenty-first century (or the so-called *WB21*). This change involved not only changes regarding the nature integration dimension, but also the slight changes regarding the degree of uncertainty avoidance in floodplain management (see Section 6.1.3 for further explanation of the new vision and policy). This change is present, for instance, in the 'Room for the River' programme. In this programme, soft measures (such as 'depoldering') are emphasised

and offensive hard measures are to be employed only when necessary (Hendriks and Buntsma 2009). In addition, occasional low-harming inundations are allowed in some areas under the framework of the state's flood risk management plan (Deltacommissie 2008).

One of the main driving forces of this change was physical condition in relation to the degree of flood risk. An episode of a near miss flood event in the region in 1995 raised awareness of changing climatic conditions and the diminished natural resilience of the region. The evaluation of the situation at that time showed that the cost of protecting the low-lying hinterland using existing strong control over nature type of measures was no longer effective in changing climatic conditions (Deltacommissie 2008). This fact has brought on the realisation that institutional adaptation in the region was needed. Policies aligned with management approaches that incorporate more of nature were considered to be more efficient. In other words, the institutional adaptation (changes in the policy approach) in this case was, according to the proposed conceptual framework, partly a result of the endogenous processes of change triggered by changes in the physical conditions of the region.

Yet, prior changes of the conceptions of the human-nature relationship affected by environmental discourses is likely to play an essential role in also supporting the endogenous processes of change, especially in floodplain management outcomes. The analysis in Section 7.1.3 reveals the likely effects of policy changes in floodplain management practised in Overdiep in 2011. Approximately half of the directly affected stakeholders from the 'Room for the River' programme agreed with the '*terp plan*' and relocated to the newly built 6 metre-high mound (*terp*) in the area where the polder would be lowered ("Depoldering of Overdiep" n.d.). Based on the conceptual framework, it could be explained that floodplain management practised in Overdiep, which corresponds to different management approaches other than traditional values regarding floodplain management, seem to be influenced by the combined effects of endogenous and exogenous factors. These factors refer to policy changes realised internally (an endogenous factor) along with changes in values triggered by environmental discourses brought in from elsewhere (an exogenous factor). These processes of changes in cultural values, planning policies and management outcomes are summarised as shown in Figure 66.

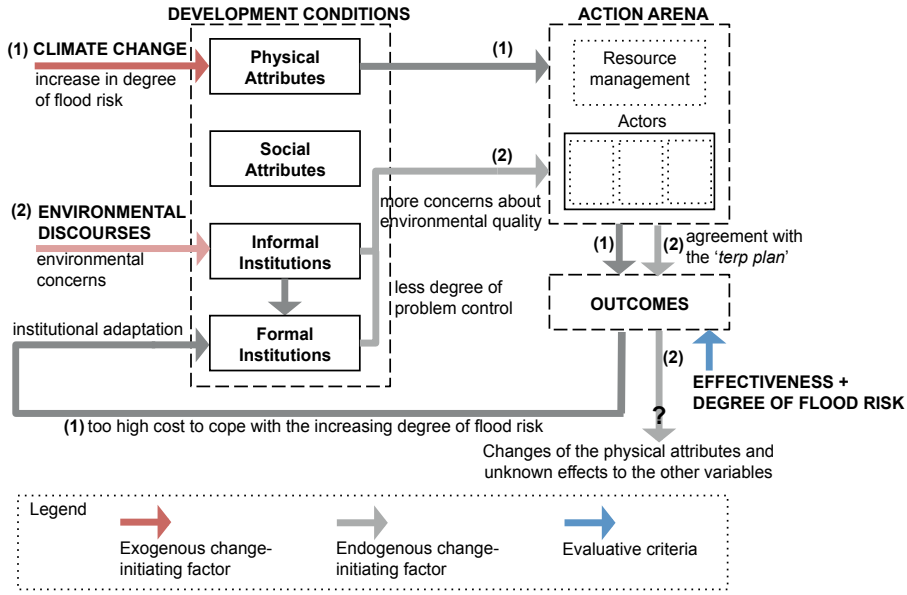

Figure 66
The processes of changes in planning approaches triggered by changing climatic conditions and new discourses

Summary

The analysis shows that changes in culture, planning policies and outcomes regarding floodplain management in the Rhine-Meuse delta region were more evident in the way humans and nature interacted (i.e. nature integration dimension) than in relation to the degree of control over nature (i.e. uncertainty avoidance dimension). In addition, the analysis reveals also the significant influence of both endogenous and exogenous change-initiating factors on the shaping of the culture, planning policies and floodplain management outcomes in the region. It shows not only that changes in the physical environment likely led to changes in cultural values through endogenous processes of evaluation and adaptation; but that transfers of discourses/knowledge were also a significant factor that likely generated changes in cultural values and significant impacts on planning policies and outcomes regarding floodplain management. Although the analysis in this section shows the significant effects of exogenous factors in triggering culture changes, effects of exogenous factors in some contexts are not as apparent as in this case. This is the case when looking at the effects of transfers of social organisation structures in the Dutch case and the transfers of technology and policies in the Thai case, which are elaborated in Section 9.1.2 and Section 9.2.

9.1.2 Changes in relation to aspects of social organisation

Unlike the observed possible strong influence of the transfer of ideas on resource management cultures, planning policies and management outcomes, the transferred institutions in relation to the social organisation aspects in floodplain management seem to have a far more limited impact on the development of the Rhine-Meuse delta region. However, changes in cultures, planning policies and management practices over time were also observed. Figure 67 summarises the important changes that are relevant for the analysis from the diachronic perspective.

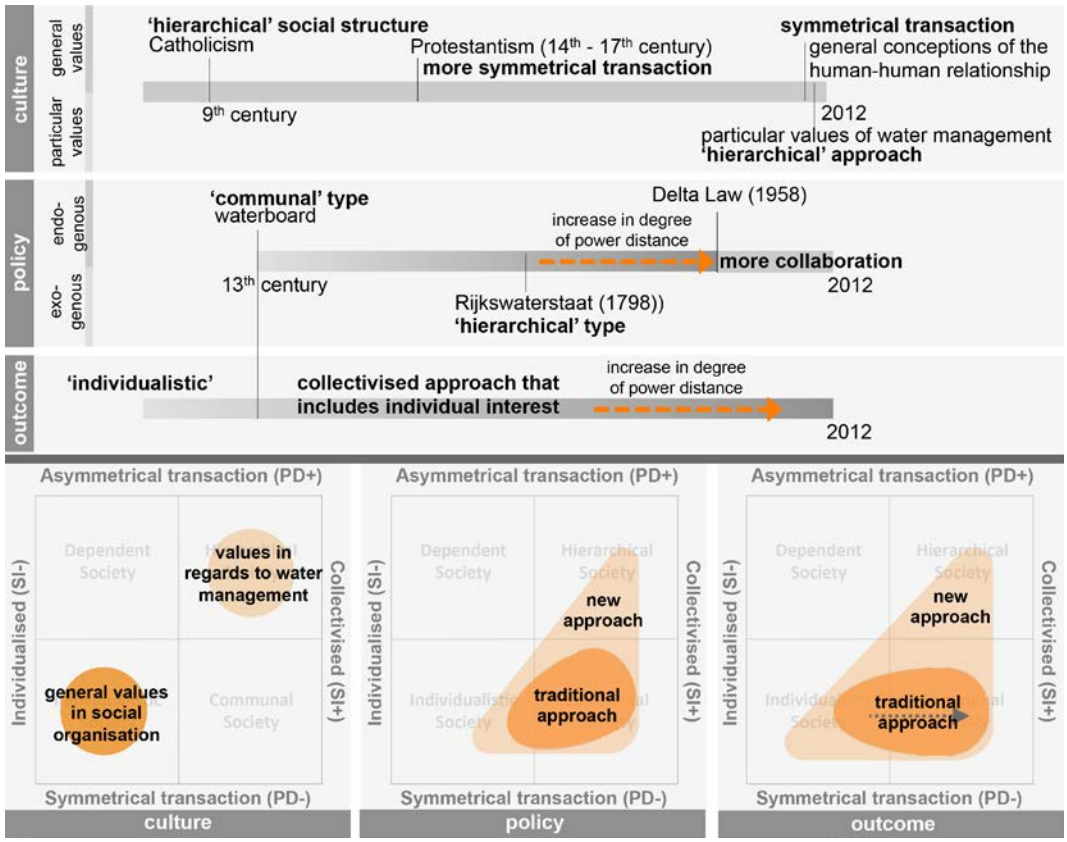

Figure 67
Changes in floodplain management approaches regarding social organisation in the Rhine-Meuse delta region

(I) Influences of fundamental world views on floodplain management

As mentioned earlier, religions are presumed in this study as strongly correlating with the cultures employed in a given community. This means that Catholicism is presumed here to provide underlying normative values (i.e. traditional core values) that have underpinned decision-making in the Rhine-Meuse delta region in the past. A collectivised management approach of water boards conforms to the collectivised characteristics present in Catholicism. This study argues that the acceptance of this new institution (water boards) in practice was underpinned by conformity between the traditional core values embedded in the region and the management approach of the new institutions. This was rather different from how people responded to the establishment of the Rijkswaterstaat in the eighteenth century, as explained below.

(II) The strong influences of core values in determining the actions in response to the asymmetrical transaction type of management in the Rijkswaterstaat

The persistence of core values corresponding to symmetrical transactions in Dutch society was clearly presented by the actions of involved actors in response to the establishment of the Rijkswaterstaat. The Rijkswaterstaat was established in 1798 as the centralised authority responsible for the design and implementation of water infrastructure provisions at the national and provincial levels (Hendriks and Buntsma 2009; "Rijkswaterstaat" n.d.). It illustrates the influence of French rule (an exogenous factor) being imposed in the region around the turn of the nineteenth century (Hendriks and Buntsma 2009; Hooimeijer *et al.* 2005). The social integration management approach of the Rijkswaterstaat is similar to that of the water boards. This refers to the collectivised management approach in which individual interests are integrated and also emphasised along with the collective interests. Yet, the management approaches regarding power distance of the two institutions are considerably different. The centralised form of authority of the Rijkswaterstaat corresponds to the considerably higher power distance than the organisational structure of the water boards, in which a significant number of the members in the general governing board and the executive committee are elected (Havekes *et al.* 2008; Lazaroms and Poos 2004).

Based on the principle of 'conformity' described in Chapter 8, this difference regarding the degree of power distance is probably one of the main factors causing the different degrees of acceptance of the two institutions in practice. The core value regarding social organisation adopted by the Dutch society with the rather symmetrical transaction management approach (see Chapter 5) is similar to the management approach of the water boards, but different from that of the Rijkswaterstaat. This non-conformity between the existing culture and the policy content helps partially explain the resistance to recognise significant roles of the Rijkswaterstaat and their planning actions at the first place when it was introduced (Reinhard and Folmer 2009). To put

in simple terms, this study argues that the responses to the Rijkswaterstaat before the midst of the twentieth century reveal the likely significant influence of the core values in determining the acceptance of transferred policies.

*(III) Crucial roles of physical attributes on cul*tural *adaptations regarding floodplain management*

Despite the resistance to the relatively asymmetrical transaction management approach of the Rijkswaterstaat at the beginning of its establishment, the institution and its management policies and implementation have gained more acceptance in the middle of the twentieth century (Reinhard and Folmer 2009). Based on the proposed conceptual framework, this greater level of acceptance is probably partly influenced by the culture changes created by the physical conditions of the region. The disastrous flood of 1953 triggered changes in public perceptions regarding the degree of flood risk of the region and led to the changes in the experiential part of culture. More precisely, this study argues that the great damage caused by the 1953 flood is one of the significant factors that made people realise the necessity for a centralised management that could perform more effectively in regards to flood protection at a broader scale than the water boards could.

The evidence above adds another perspective regarding the roles of culture in shaping decision-making processes and development outcomes. It is that not only the core values that determine the management practice, but the experiential part of culture may also play an important role in this; and that this experiential part of culture is significantly shaped by physical conditions of an area. However, it was observed in this work that the adaptation of formal institutions to match core values appeared essential in this case. The 'hierarchical' management approach (with a high degree of power distance) of the Rijkswaterstaat was adapted to and integrated with existing organisations and management approaches, which corresponded with the rather low degree of power distance approaches. This process of adaptation and integration was a result of the Delta Law launched in 1958, which enforced collaboration between central and local authorities using legislative and financial measures (Stive and Vrijling 2010).

In short, the analysis of floodplain management in the Rhine-Meuse delta region regarding social organisation aspects reveals that physical conditions most likely have a strong influence in determining the experiential part of culture and floodplain management practice. This is illustrated in Figure 68. On the contrary, the effect of policy transfers (changes in formal institutions) on culture and management outcomes is rather marginal, if the management approach of the policy is significantly different from the core values of a society.

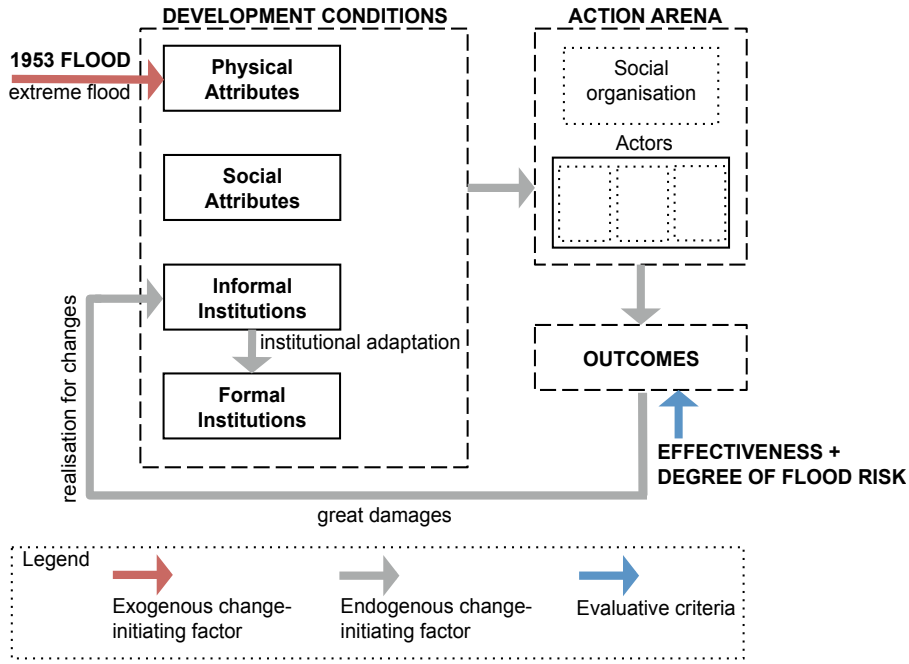

Figure 68
The processes of institutional adaptation in the Rhine-Meuse delta region after the 1953 Flood

Summary

The analysis in this sub-section shows that changes in culture, planning policies and outcomes in the Rhine-Meuse delta region occurred in both dimensions regarding the social organisation aspects in floodplain management. These dimensions refer to the degree of authority or responsibilities that one or more actors have over others (power distance dimension) and the degree of association between actors in management processes (social integration dimension). It reveals that changes were likely more affected by endogenous factors than exogenous factors. Unlike the observed strong and direct impacts of the transfer of ideas through environmental discourses during the 1970s on Dutch resource management culture, planning policies and management outcomes, the effects of exogenous factors on floodplain management regarding social organisation aspects were rather indirect. In this case, the exogenous change-initiating factors only triggered changes in other development conditions and created new conditions that led to culture changes through endogenous processes.

9.2 Evolution of culture, planning policy and outcomes regarding floodplain management in the Chaophraya delta region

Similar to the analysis of the floodplain management in the Rhine-Meuse delta region, changes in management culture, planning and outcomes over time were also observed in the analysis of floodplain management in the Chaophraya delta region. However, the factors that triggered changes in culture and floodplain management outcomes in the two case studies are rather different. These differences are elaborated in the following sub-sections.

9.2.1 Changes in relation to aspects of resource management

Figure 69 summarises significant changes in resource management aspects of floodplain management in the Chaophraya delta region. This includes changes in culture, planning policies and management outcomes. There are four important points that are relevant for the analysis from the diachronic perspective, as elaborated below.

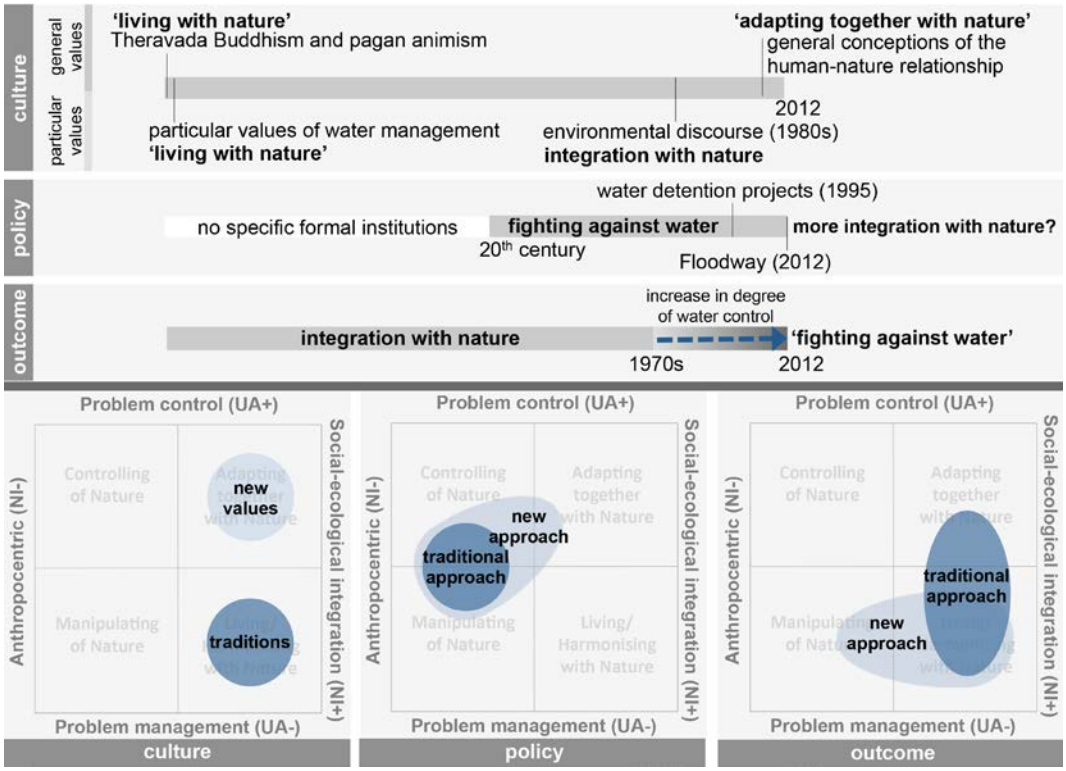

Figure 69
Changes of the floodplain management approaches regarding resource management aspects in the Chaophraya delta region

(I) The predominance of the 'integration with nature' management approach in the twentieth century

The first observation from the figure above is in regards to the marginal effects of anthropocentric policy approaches on management outcomes in the Chaophraya delta region before the 1970s. The anthropocentric resource management approaches refer to ways to cope with floods by controlling or manipulating water rather than by changing human behaviours. As mentioned earlier in Chapter 6, the anthropocentric management approach was introduced into the planning of the region through transfers of knowledge and policies from western countries. Based on the proposed conceptual framework, these transfers are considered as an exogenous change-initiating factor and argued as resulting in changes in formal institutions in relation to the floodplain management of the region.

The figure above showing the development timeline in the Thai case shows that this change of formal institutions did not lead to immediate culture changes as was the case with the influence of environmental discourses in the Dutch case. In other words, it was observed that floodplain management measures associated with a high degree

of integration with nature have remained predominant practices in the region, despite the presence of anthropocentric management approaches in management policies since the beginning of the twentieth century (see Section 6.2 for further explanation). This was evident in the concentration of settlements on relatively high ground and the customs and practices people developed to live their lives during occasional flooding periods, as analysed in Section 7.2.1.

Drawing from the analysis, it is argued here that the planning practices and the spatial development outcomes in the Chaophraya delta region at that time remained primarily influenced by core values, which correspond to a high degree of nature integration and acceptance of uncertain situations. The analysis reveals that changes in formal institutions do not necessarily lead to immediate changes in planning practice and outcomes, especially when the policy content does not conform to the existing local culture.

The observations above suggest that this persistence of traditions in floodplain management might be caused by several factors with various reasons. Based on the findings from the sub-national level analysis, physical conditions are likely a key element in determining flood management practices and outcomes. The analysis shows that people living in different areas may have different experiences regarding interactions with nature and the effects of flooding, despite the common core values they share. It shows also that different experiences created by the different physical conditions in the areas may result in variations between local cultures, of which the experiential part of culture plays a more important role in practice than core values (see Section 7.2.4 for the detailed analysis). More precisely, it is likely that the physical attributes that are associated with a high degree of flood risk create the conditions that call for flood prevention and resistance to living with floods.

The evidence above helps explain the persistence of the traditional 'living with water' management practised in the Chaophraya delta region. In other words, it is possible to conclude from the analysis above that as the degree of flood risk in the region was generally rather low, living with floods was possible and flood prevention appeared unnecessary. This argument regarding the significant role of physical conditions is supported by the evidence given below in relation to recent changes in the floodplain management approaches practised in the region.

(II) Effects of the 'fighting against water' policies on planning practice and spatial development outcomes in the last few decades

Despite the aforementioned persistence of the traditional management approach practised in the Chaophraya delta region, gradual changes in planning practices and spatial development outcomes towards the anthropocentric approach were observed in the policies analysed. The changes began in the 1970s and became clearly visible only at the end of the twentieth century. The changes were expressed in the form of

the expansion of housing estates in moderately flood-prone low-lying areas and the investment in large-scale projects (such as industrial estate and university) in naturally swampy areas (Askew 2003; Ouyyanont 2000). The development in Khlongluang is a clear example of these changes. Activities that have a high risk of being negatively impacted by flooding took place in this highly flood-prone area. This implies the gradually diminishing practice of the ways people cope with floods by adapting their behaviours and the increasing attempt to control over nature.

It seems that these changes in planning practice and the spatial outcomes were not directly influenced by changes in formal institutions. This is supported by the delayed changes in the practice and the outcomes that occurred about 70 years after the anthropocentric type of planning policies was introduced and implemented in the region. Rather, the changes were likely the indirect effects of the anthropocentric planning approach, as it created new physical conditions for development. The construction of dams and dikes have reduced the frequency of flooding in the naturally highly flood-prone areas (Jarupongsakul and Kaida 2000). This allowed urbanisation to take place in these areas, most of which were previously left unattended. The evidence shows that it is likely that the lowered flood frequency made people less concerned about employing spatial development patterns and architecture that would enable them to live with floods as they had done previously. This new type of development pattern seems to create conditions in which interactions between human and nature and the degree of resilience to floods of the settlements are reduced. With this type of development patterns, floods become a threat and likely generate more serious damages than they would do to the settlements in which the concerns about living with floods are incorporated in the development processes.

Drawing from the analysis above, it is possible to add another perspective to the understanding of the influences of transferred policies in determining planning practices and outcomes regarding floodplain management to the understandings derived from the previous chapters. In Chapter 8, the analysis shows that the conformity between policy contents and an existing culture is essential for determining whether a policy would be accepted in practice. The analysis in this sub-section reveals that transferred policies may also affect planning practice and spatial development outcomes, even in cases that the policy content does not conform to existing cultures. The spatial-related management policies may change the physical conditions of the area regarding the degree of flood risk. The transformation of physical attributes may then act as an endogenous change-initiating factor triggering changes of people's flood risk perception, which could lead to changes in their management approaches to deal with floods under the new conditions. Figure 70 summarises this iterative process of change. The process may take quite a long period of time for the spatial effects to become evident. This is because it requires some time for actors to experience the changing conditions and to realise, through the iterative processes of evaluating outcomes, the necessity or opportunity for adaptation.

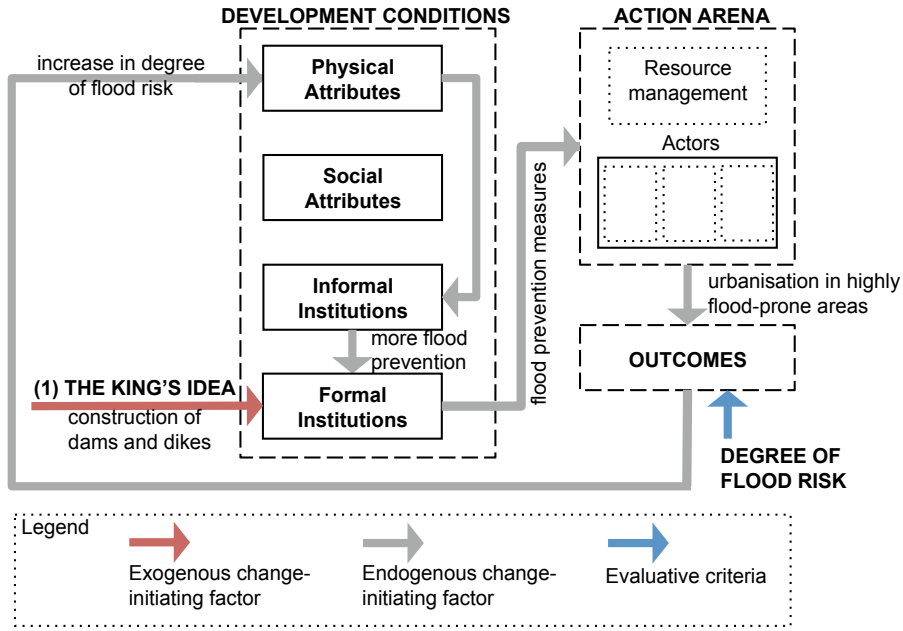

Figure 70
The processes of changes in culture, planning policies and floodplain management outcomes in the Chaophraya delta region triggered by the transferred 'fighting against water' policies

(III) Influences of flooding experiences on the institutional rearrangement at the turn of the twenty-first century

The analysis of the Dutch case shows the influence of changes in physical attributes on transforming people's perceptions of flood risk, which was followed by a call for stronger flood prevention measures for higher risk areas. The analysis of the Thai case also shows the effects of the changes of in physical attributes, but with the opposite result.

As explained earlier, the 'controlling of nature' policy approach helped reduce the frequency of flooding and resulted in urban expansion into naturally highly flood-prone areas. However, these flood prone areas still experience flooding in years with extreme rainfall. As the areas have been more urbanised and become less resilient, the degree of damage caused by extreme floods increased significantly. The increase in damages especially evident during the 2011 flooding event. The extensive damage that occurred in 2011 has brought greater attention to the 'floodway' principle, an idea of King Rama IX initiated since the 1980s and being emphasised again after the 1995 flood (Reumvieng 2011) (see Section 7.2.3 for more explanation). Several sources in the media (such as"Revision of the Bangkok Land Use" 2012; and "Real Estate Developers" 2011) showed public disputes during the 2011 flooding event on whether

urbanisation in the natural floodways and the flood prevention measures in these areas was one of the major causes of the major damages and the extraordinarily long period of inundation in the upper region. The disputes involved various groups of people, from professionals to laymen. The disputes imply the scepticism of some groups of stakeholders towards the recent development direction based on the 'controlling of nature' management approach. In other words, the disputes show the likely impact of changing physical conditions on actors' cultural traits regarding the nature integration dimension in floodplain management. In this case, it is argued here that culture change took place as a result of changes in the experiential part of culture; and the recent development patterns played a crucial role in this change.

The supporting evidence that the changes in the physical attributes were a significant underpinning factor for the culture change towards the 'working together with water' management approach is the period that impacts of the change in management approach became evident. Despite the announcement of King Rama IX's policy directive since the 1980s (Reumvieng 2011; Tapananont and Noppan 2011), its concrete impacts on policy implementation have not been as widely recognised as they were during the 2011 flooding event. Its impacts were visible in the introduction of the 'rural and agricultural conservation' land use type in the 1999 Bangkok Land Use Plan (CPD n.d.) and the implementation of *Kam-ling* [a form of flood detention] projects (see Section 7.2.3 for detail of the plan and the projects). Although the implementation of *Kam-ling* projects was not opposed by the public, it was observed that the idea of 'working together with water' and being more integrated with nature had not widely affected the practices of the non-public sectors at the time. Instead, increases in the degree of 'fighting against water' over time were observed in the management approaches practised in the region, especially in the new settlements. From the spatial analysis Section 7.2, it was observed that rapid urbanisation processes have continued in the natural floodways, on which land use restrictions were enforced. The disputes amongst the public on whether the 'working together with water' management approach could reduce flood damages became evident only during the 2011 flooding event (Reumvieng 2011; "Revision of the Bangkok Land Use" 2012; and "Real Estate Developers" 2011). The delayed impacts of the King's initiatives and the new policy approach is argued here as resulting from the rapid increases of urbanisation in the swampy areas have become apparent only since the turn of the twenty-first century.

In addition to that, different opinions on the 2013 Bangkok Land Use Plan (CPD 2013) in different districts were observed during the public hearing held in 2012. These different opinions show evidence of the influences of physical conditions in shaping culture and actions regarding floodplain management. The plan uses the 'rural and agricultural conservation' land use type to regulate development in several parts of Bangkok, including both eastern and western areas. However, there were a number of disagreements and controversies concerning the land use regulations by the involved stakeholders for the development in the eastern part of the region, whereas disagreements and controversies were marginally observed from stakeholders' opinions in the western part ("Revision of the Bangkok Land Use" 2012). Although there are several reasons that may explain the disagreement of actors in the western part, it is likely that the high degree of flood risk in the area is one of the crucial underpinning factors. More precisely, by leaving water to pass the land during the extreme floods, the swampy nature of the land and the dense development patterns in the east would result in greater damages than it would in the west, where development is less dense in the areas on higher ground. In other words, it shows that a high degree of flood risk in an area is likely to result in management cultures and practices corresponding to a high degree of flood control (i.e. uncertainty avoidance) rather than to let floods occur and then deal with them.

In short, the evidence above reveals the likely crucial influences of physical attributes in terms of how actors support or resist formal institutional arrangements. Drawing from the analysis above, it could be concluded here that the acceptance of the 'fighting against water' type of policies occurred partly as a result of the changes of the experiential part of culture triggered by the changes in risk perception. Without such changes, the effects of the new ideas brought into planning appeared rather limited (affecting mainly the public sector only). This endogenous process of change is summarised in Figure 71. It should be noted that the limited influence of the change in the management and planning policy approach on management outcomes was noticeably different from the broader impact created by the 2011 flood. In other words, the analysis of the Thai case reveals the greater effects of changes in physical attributes than changes in formal institutions on planning practices.

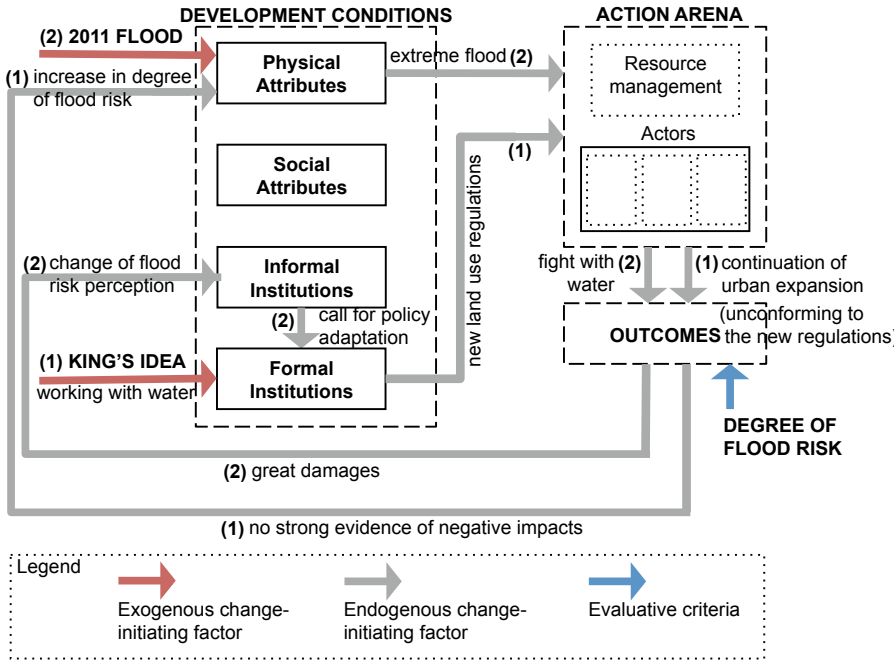

Figure 71
The processes of changes regarding the resource management aspects in floodplain management in the Chaophraya delta region triggered by the great flood damage in 2011

(IV) Marginal effects of environmental discourses

The last observation relates to the different effects of environmental discourses in the two delta regions. Unlike the significant influences of environmental discourses on planning practices in the Dutch case, such influences were not evident in the Thai case. The main difference regarding feedbacks to environmental discourses between the two regions analysed concerns the actions of different actors driven by environmental management discourses. Since the 1980s, a number of environmental movements and programmes in Thailand have been observed. These include, for instance, mangrove reforestation programmes, which were arranged mainly by non-public actors (including NGOs, private sectors and civil society). Yet, effects on public sector planning approaches were observed to be rather marginal. The 'fighting against water' management approach has remained predominant in public policies, despite the introduction of environmental discourses (see Section 6.2 for further detail). The civil society in the Thai case chose to arrange the activities by themselves. Attempts to get involved with the public sector were rather minimal. This is different from the Dutch case, in which the civil society put efforts to push the government to rearrange institutions in accordance to the ideas they adopted. This refers to the case of the redesign of the Oosterschelde, as described in Section 6.1.3.

The comparison of the two cases above suggests that changes in culture regarding resource management may not be the only factor that determines whether changes will take place in the planning policy and management outcomes. But this determination may also significantly depend on cultural traits regarding the social organisation of involved actors. This issue is elaborated in the next sub-section.

Summary

The analysis from a diachronic point of view shows changes in cultural traits, planning policies and floodplain management outcomes both regarding the way humans and nature interact (nature integration dimension) and the degree of control over nature (uncertainty avoidance dimension) in the Chaophraya delta region. It shows not only the strong influence of traditional core values, but also the significant role of the experiential part of culture in shaping planning practices and spatial outcomes. This experiential part of culture was observed as evolving over time, affecting mainly by changes in physical attributes. It reveals that a new policy may not create direct and immediate effects in planning practice and development outcomes. Rather, it may generate indirect effects through changes in physical conditions, which then may significantly influence decision-making and the shaping of development outcomes. This is because the new physical conditions might create new values in the experiential part of culture, which would then result in culture changes.

In addition, the analysis also reveals that culture changes and the impacts on outcomes can be expected, regardless of whether they are triggered by endogenous change-initiative factors (through institutional adaptations resulting from the evaluation results) or exogenous factors (such as policy transfers). Yet, the time that the effects would become noticeable varies. This depends on the degree of impacts created by the change-initiative factor on people's perceptions regarding the degree of flood risk of an area.

9.2.2 Changes in relation to aspects of social organisation

The analysis in the previous sub-section reveals the significant impacts of the administration reforms and policy transfers at the turn of the twentieth century on culture and practices in relation to the resource management aspects in the Chaophraya delta region. The impacts in relation to social organisation aspects in the territorial and water management of the region were also observed. Figure 72 summarises the significant changes of expressions in social organisation. It shows two important points that are relevant for the analysis from the diachronic perspective.

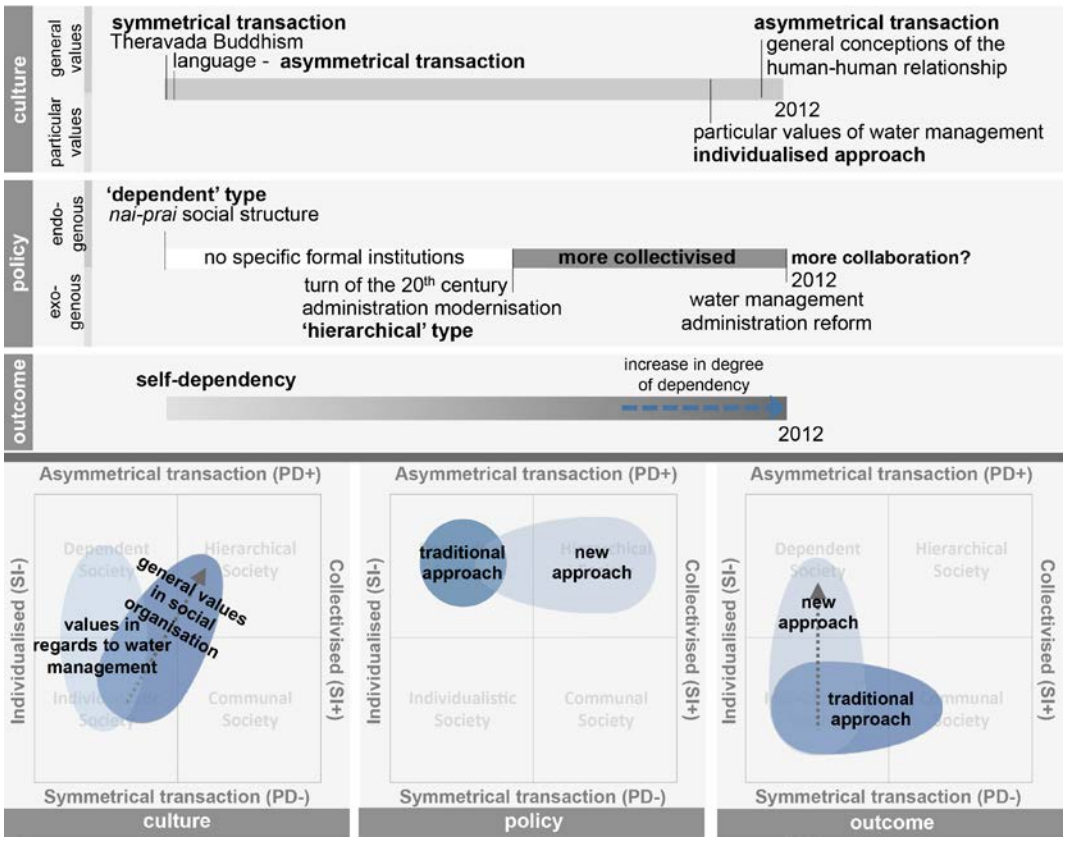

Figure 72
Changes of the floodplain management approaches regarding social organisation aspects in the Chaophraya delta region

(I) Persistence of the individualised approaches in floodplain management

The figure above shows that effects of the 'hierarchical' management approach of the new institutions introduced at the turn of the twentieth century on the management outcomes in the Chaophraya delta region were not evident. Although the territorial and water management practices in the recent years seem to move towards a more asymmetrical transaction approach, the conventional individualised characteristics in territorial and water management have remained predominant in floodplain management practised in the Thai case. This persistence of traditions regarding social organisation shows similar effects as the effects of policy transfers regarding resource management in the region. It shows the similar point regarding the marginal connection between present general values and floodplain management practices.[21]

21 The general values are inferred from the data derived from recent surveys, including the WVS (n.d.) and Hofstede's survey about national cultures (Hofstede 2011).

This similar point is that current management approaches were aligned with traditional core values as well as particular values in relation to the flood management issues more than general values derived from recent surveys.

The observations above show that the continuation of traditional management approaches in practice was likely influenced more by the experiential part of culture than by the core values. This experiential part of culture has changed over time in accordance with changing contextual conditions. Specifically for this case, the persistence of the individualised management approach is argued here as likely influenced by the low degree of flood hazard and risk of the region. In other words, this study argues that this physical characteristic of the area creates the conditions in which collective actions for the management of flood-related issues are not essential. This results in a perception that there is no need for collectivised approach in floodplain management as aimed for by transferred policies introduced since the twentieth century (see Section 6.2.2 for further detail of the policies).

(II) Effects of changes in formal institutions through policy transfers on the culture and management outcomes in relation to floodplain management

Despite the persistence of individualised characteristics in floodplain management practised in the Thai case, the evidence elaborated in Chapter 7 reveals a changing management approach towards the more asymmetrical transaction approach in planning practice and spatial development outcomes since the late twentieth century. This recent change in management outcomes is argued here as being influenced by the 'hierarchical' type of management that has been practised by competent authorities in the managements of flood-related issues in the Chaophraya delta region since the early twentieth century.

Based on the conceptual framework, it is argued here that the changes in floodplain management outcomes since the late twentieth century were influenced by changes in various development conditions. The administrative modernisation since the nineteenth century created a new form of social structure and organisation. This new form refers to the territorial and water management system in which a centralised sector-based management approach replaced the traditional decentralised and community-based management approach (see Section 6.2.1). As the role of the centralised authority and experts increased, community bonds and authority became weak. As time has gone by, people have become more familiar with receiving help and support from more powerful sectors, including the state and local politicians. This resulted in cultural adaptations. It has created an experiential part of the culture that is associated with a higher degree of power distance than the core values regarding floodplain management in Thai society.

Apart from the influences of formal institutions through the formation of the experiential part of culture, social attributes also played an important role in shaping an increased degree of power distance in the floodplain management practised in the region. Figure 72 shows that the management approaches undertaken in the region has moved more towards the 'dependent' type instead of moving towards the 'hierarchical' type of management as suggested by the formal institutions. Analysing the changes of development conditions shown in the diagram, it could be concluded that the traditional 'dependent' type of social structure and organisation based on the *nai-prai* ['patron-client'] relationships is probably a main underpinning factor of the changes towards the 'dependent' type, rather than the 'hierarchical' type (see 5.2.2 for further explanation about the *nai-prai* relationships). Figure 73 summarises this process of change.

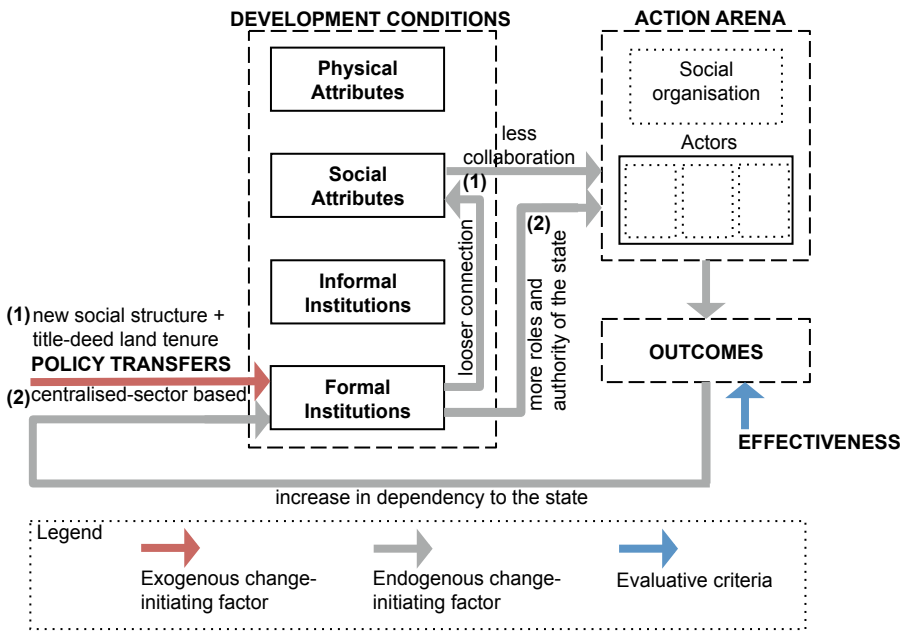

Figure 73
The processes of changes regarding resource management aspects in floodplain management in the Rhine-Meuse delta region triggered by technological advancements

Summary

The analysis above of relations between culture, planning policies and management outcomes in the Thai case show that it is less likely that policy transfers alone would generate significant changes in culture and floodplain management practised by all

sectors compared to when they are also underpinned by other development conditions that support the changes. In other words, the process of changes in culture and management outcomes regarding social organisation aspects in the Chaophraya delta region were triggered by an exogenous factor (i.e. policy transfers in this case), but the effects became increasingly evident over time as a result of the endogenous processes of change. Specifically, these changes are illustrated through an iterative process of evaluating outcomes and institutional adaptations. However, the effects of policy transfers in determining culture and practices regarding floodplain management were rather evident regarding the power distance dimension only. This process of changes regarding the power distance dimension was underpinned by social attributes that support the direction of change triggered by the policy transfer. For the social integration dimension in floodplain management, the analysis shows that the policy transfer did not have significant effects in determining culture and practices regarding floodplain management of all sectors in the Thai case. Rather, physical conditions are likely the major element shaping culture and practices in this case, especially for those outside the public sector.

9.3 Summary and remarks: dynamics of culture and its impacts on floodplain management

The analysis of floodplain management in the two delta regions using the diachronic perspective supports the findings derived from the analysis using a synchronic perspective regarding the significant influence of culture in shaping planning practices and spatial development outcomes in relation to floodplain management. In addition to that, the analysis at the sub-national level from a diachronic and relational perspective in this chapter adds a better understanding about cultural variations in different areas across a region, in which common core values and rules are assumed. The framework breaks down the factors influencing decision-making in the form of four interconnected development conditions and helps explain these variations. Based on the findings in this chapter, it is possible to make a preliminary conclusion that planning practices and spatial development outcomes regarding floodplain management are underpinned by two parts of culture – (i) the part that is shaped by core values and (ii) the experiential part of culture. The experiential part of culture is strongly related to the physical conditions of a given territory and social attributes of the community, which may vary in different areas of a region. Based on the analysis, it is argued here that these variations of physical and social attributes create local cultures; and these local cultures may diverge from the general core values shared by society in a given area.

Additionally, the findings point to the interrelationships between the four development conditions. They suggest cultures should be viewed as a set of dynamic normative values rather than as static taken-for-granted values. This is because the findings show that culture is interrelated with other development conditions that are subject to changes; thus culture keeps on changing over time too. It other words, the findings reveal dynamics of culture regarding floodplain management, which is related to changes in underlying conditions that influence the shaping of cultures and management outcomes. However, the findings show that each dimension of culture is sensitive to different kinds of change in different degrees.

The empirical analysis reveals the strong influence of physical attributes in shaping culture and management outcomes in regards to the uncertainty avoidance and the social integration dimensions regarding floodplain management. It shows also the crucial impacts of changes in planning regulations and policies (i.e. 'formal institutions' in this study) on planning practices and spatial development outcomes. Yet, the changes in formal institutions did not have direct impacts on the changes of the planning practices and spatial outcomes. The analysis shows that the changes of formal institutions generated changes of physical attributes and activities in a given territory that resulted in changes of the degree of flood sensitivity and risk of the area. Based on the proposed conceptual framework, these changes arguably affect how people conceive their relationship to floods and shape ways to manage them. In other words, this study argues that changes of policies in relation to the uncertainty avoidance and social integration dimensions of management may trigger changes in culture and management outcomes through endogenous iterative processes of evaluation and adaptations of the experiential part of culture.

On the other hand, evidence from the analysis of the two regions shows that cultures and management outcomes regarding the power distance and the nature integration dimensions of floodplain management appeared to be less sensitive to changes in physical attributes in comparison with the uncertainty avoidance and social integration dimensions. Rather, it appeared that changes in planning practices and development outcomes concerning floodplain management in relation to the power distance and nature integration dimensions usually occurred along with changes of core values. The analysis suggests that core values may change over time. The adoption of new discourses or values in a society is an example of factors triggering changes in core values.

Furthermore, the analysis of the two regions reveals that the changes in culture generated effects on people's expectations about planning policies and actions. This happened regardless of whether culture changes are triggered by changes in physical conditions or new discourses. For instance, people tended to call for stronger flood prevention measures (higher uncertainty avoidance) as the degree of flood vulnerability of their area increased due to changes in physical attributes and economic activities. Another example is the call for reconsideration of policies that were accepted earlier, but now do not conform to new values, as observed in the Dutch case regarding aspects of resource management.

In short, the diachronic analytical perspective appears to be a useful framework that helps with understanding the interrelationships between culture, planning policy and territorial management outcome and its influences in territorial management as a process. The empirical analysis based on this framework shows that culture is dynamic and has crucial impacts on the shaping of planning practices and spatial development outcomes. It shows that spatial interventions could be useful for directing development outcomes as aimed for in planning. Yet, they are not effective for all dimensions, but only for some particular dimensions of culture. In the specific context of floodplain management in urbanised delta regions, for instance, spatial interventions could be useful for directing development outcomes regarding the uncertainty avoidance and the social integration dimensions.

In addition, the analysis also reveals that the spatial consequences created by planning policies may in turn generate changes in culture that then influence planning practice and spatial development outcomes. This view of culture as dynamic values that are subject to changes over time is considerably useful for planners. It helps raise awareness amongst planners of the need to take local cultures into consideration when making and implementing policies and to be cautious about the possible impacts of the policies they implement on cultural values. This is because changes in cultural values would then affect both planning objectives and management outcomes.

PART IV Conclusions: Significance of Culture in Territorial Management Processes and its Implications for Spatial Planning

10 Theoretical and methodological implications of culture for spatial planning

11 Application of the theoretical findings for public policy analysis

10 Theoretical and methodological implications of culture for spatial planning

As mentioned earlier, lessons from past development have informed planners that conformity between planning objectives and territorial development outcomes often yield unexpected results. This is especially evident in regards to outcomes generated by transferred ideas, institutions, models and programmes. Developing better understandings on issues of inconformity between planning objectives and territorial management outcomes is thus fundamental for planners. It is especially crucial at present, as a high degree of transfer of policy ideas, institutions, models and programmes has been observed in the last century. It occurred at all levels of development, including the cross-regional, cross-national and sub-national levels. These transfers have been fostered significantly by globalisation processes, which have increased communication between different parts of the world dramatically (Hantrais 2009; de Jong *et al.* 2007).

The transfers are expected to pass successful practices in one place to help solve seemingly common problems that occur in other places. However, previous experiences have shown that a policy or a programme successfully applied in one place does not always generate expected outcomes when it is applied without adaptation to the places with different contexts (Knieling and Othengrafen 2009b; Sanyal 2005). This has brought a significant amount of attention of the subject of transfer in the fields of political sciences and spatial planning over recent years (Stead *et al.* 2008). Great attention has been given to the question '*under what circumstances and to what extent will a programme that works there also work here?*' (Hantrais 2009, 137).

There have been wide debates in the fields of political sciences and spatial planning over recent years on whether culture is an important element that significantly influences planning practice and determines policy transferability. (Friedmann 2005a, 2005b; de Jong and Mamadouh 2002; Stead *et al.* 2008; Sanyal 2005; Ostrom 2005a; Knieling and Othengrafen 2009b). However, reviews of previous studies show that knowledge on this issue is still rather limited in the field of spatial planning. Analyses that take into account the expressions of culture in the form of the activities performed by actors other than planning professionals solely is still rather lacking. This study thus develops an integrative conceptual framework, aiming to further the understanding, both theoretically and methodologically, on the interrelationships between culture, planning policy and territorial management outcomes from a broader perspective.

The following sections summarise the findings derived from the empirical study conducted here using this integrative conceptual framework. The findings include significant observations contributing to theoretical development regarding interrelationships between culture, planning policy and territorial management outcomes. These findings are then elaborated in the form of implications for spatial planning. They also contribute to methodological development in public policy analysis from a cultural perspective.

10.1 Summary of the empirical findings: is culture an important element influencing planning practice and territorial management outcomes?

This section summarises the main empirical findings, with special emphasis on whether culture is a significant element determining decision-making and outcomes in territorial management processes. It also explores under which conditions in relation to culture the achievement of planning objectives could be expected in practice. The evolution of cultural traits, planning policies and territorial management outcomes in the specific context of floodplain management in two selected delta regions is elaborated and compared in Part II. The analysis is based on the synchronic and the diachronic approaches proposed in this work. Findings regarding the evolution and interrelations between those elements reveal five major remarks that are relevant for the improvement of spatial planning practice. In general, much of these findings support arguments and theories proposed in previous studies in relation to influences of culture in territorial management processes. Yet, there are also significant findings that provide opposing views to the existing theories and understandings of the influences of culture in territorial management. They are summarised as follows.

I Importance of 'conformity' between policy content and local cultures

A number of studies have indicated the importance of 'conformity' between policy content and local cultures as one of the fundamental conditions enhancing the transferability of a policy. These include, for instance, the findings presented in de Jong and Mamadouh (2002) and Marsden and Stead (2011). This 'conforming' condition is one of the factors suggested in the conceptual framework developed in this study as to promote policy acceptance in practice. The empirical investigation and the analysis in Chapter 8 provide evidence that validates this premise underpinning the conceptual framework.

An example of the supporting evidence is the analysis of planning practices and spatial development outcomes in responses to the policies corresponding to the 'fighting against water' and the 'hierarchical' type of management in the case studies. The empirical analysis reveals considerably distinctive actions and development outcomes in the two delta regions to the seemingly common approach present in their policies. In the Rhine-Meuse delta region, the policies corresponding to the 'fighting against water' management approach executed by the competent authorities have gained support from the public and the relevant actors in practice at all levels (see Section 7.1). In contrast, this similar management approach was not widely accepted by the public in the Thai case. This is especially evident in the failure of the state to implement the flood management policy and actions during the 2011 flooding in the Chaophraya delta region (see Section 7.2.3 for further explanation).

The above evidence along with the analysis of the cultural traits in Chapter 5 shows that the distinctive outcomes in the two regions are likely influenced by their different cultural traits, regarding both the resource management and the social organisation approaches.

The predominance of the 'controlling of nature' management culture associated with strong concerns for collective interests in the Dutch case seems to be an element underpinning the territorial management outcomes that conform to the 'fighting against water' and the 'hierarchical' types of policies. This is because of the conformity between the policy content and the local cultures, which corresponds to a high degree of problem control and collectivised management approaches. On the other hand, the Thai cultural context in which control of floods and collective-based management are conceived as not necessary. This conception does not conform to the management approaches present in the policy, and thus argued here as part of the reasons explaining the failure to implement the policy in the Thai case.

In addition, the analysis reveals the strong role of the 'conformity' regarding the social organisation approach in determining the acceptance of policy regarding the resource management approach in practice. This is evident when looking at, for instance, the tensions towards the policies and programmes executed by the Rijkswaterstaat in its early period of establishment, despite the common 'fighting against water' resource management approach shared with the policies executed by water boards (see Section 8.2.2). This is also made evident in the agreement of about half of the inhabitants and entrepreneurs to relocate on a newly-built mould in Overdiep according to the '*terp plan*', despite the strong 'controlling of nature' cultures embedded in Dutch society (see Section 7.1.3).

II *Strong relations between cultural traits and physical attributes*

Many studies have indicated close relationships between cultural traits and natural environments. For instance, Gullestrup (2006, 102) stated that '*... culture is more or less dependent on both the social and natural environments, and it will impact on this environment in varying degrees.*' Gooderham and Nordhaug (2001, cited in Hofstede 2011) also argued that '*[t]he core differences in values between cultures go back to questions of what works for ensuring survival in relation to the natural environment.*' The empirical analysis in this study provides evidence that supports these premises. It was observed that people living in areas where the degree of flood risk is high are likely to have different experiences from those living in area associated with a low degree of flood risk. The analysis shows that their different experiences are likely to contribute to the values they adopt and based on when making decisions to deal with flood-related issues. The higher the degree of flood risk of the area, the higher level of control of water and possible problems is called for.

This relationship is apparent not only from the comparison between the two delta regions. It is evident also from the analysis at the sub-national level. Distinctive spatial development patterns and different management measures taken to cope with floods amongst the three districts in the Chaophraya delta region in Thailand were observed. The analysis of the local cultures from the interviews shows that although the core values regarding human-nature and human-human relationships of people living in the three districts are quite similar, their cultural traits in relation to management of flood-related issues are quite different. This difference is observed as closely related to variations of physical attributes in the three districts.

In short, the analysis at the cross-national and sub-national levels provides consistent findings, namely that physical conditions of the area in relation to the degree of flood risk are likely to influence the formation of local cultures regarding management of flood-related issues significantly. These local cultures may vary in different areas in which common core values, rules and regulations are shared, if the physical conditions regarding degree of flood risk are diverse across the territory. However, this study only investigates influences of individual's direct experience on formation of local cultures regarding management of flood-related issues. Further investigation in regards to influences of indirect experiences is advised. Indirect experiences include, for instance, communication from one generation to the next by story telling, formal education and reading literature. This is because understanding influences of indirect experiences may provide complementary mechanisms to spatial planning mechanisms for shaping local conceptions and actions in regards to management of flood-related issues.

III *Different degrees of effects of changes of physical attributes on the different dimensions of culture*

The above findings derived from the analysis using the synchronic analytical framework on the likely strong relations between cultural traits and physical attributes is consistent with the findings derived from the analysis based on the diachronic approach in Chapter 9. However, the analysis using the diachronic analytical approach points out the different degrees of influences of physical attributes on the shaping of cultures and outcomes with regard to the different dimensions of culture regarding floodplain management. The findings show that the dimensions of culture regarding floodplain management can be categorised into two main groups – (i) those with strong relations with physical attributes and (ii) those with strong relations with core values.

The dimensions of culture that relates strongly with physical attributes include (i) the uncertainty avoidance dimension, referring to the degree of tolerance of ambiguity potentially created by floods, and (ii) the social integration dimension, referring to the degree of association between people in the social unit to management flood-related issues. The analysis based on a diachronic perspective reveals that changes of the physical attributes largely affected personal experiences and influenced how people evaluated and changed their conceptions in relation to those two dimensions of culture. The analysis reveals that the higher the degree of flood risk of the area, the more intolerance to the uncertain situations created by floods exists; and the higher the degree of flood hazard, the more the need for collective management. These relations are reflected in the different ways people living in places with different physical environments in regards to degree of flood risk used to deal with flood-related issues and how the actions changed when the physical conditions changed.

On the other hand, changes of physical attributes have been observed to have rather marginal influences on the decision-making and the management outcomes with regard to the other two dimensions of culture. These two dimensions are (i) the power distance dimension, referring to the degree of authority or responsibility that one or more actors have over the others in floodplain management, and (ii) the nature integration dimension, referring to the choice between manipulating water and adapting human's behaviours. It was observed that decision-makings with regards to this group of dimensions of culture remained rather conform to the core values and traditions, even when the physical conditions of the area have changed.

The different degrees of sensitivity to different development conditions of these two categories of culture imply different points of concern in planning practices. Friedmann (2005a, 184) mentioned that '... even as it [planning culture] draws upon the contributions of other societal actors, it is deeply embedded in the political culture of

the country and/or individual cities and, as such, is always historically grounded.' This statement implies strong influences and necessity to aware of influences of core values in planning processes. Yet, evidence from many studies (such as Reimer and Blotevogel 2012) suggests that individual forces are also essential in shaping the evolution of 'traditions of planning action'. The findings in this study contribute to understandings of elements influencing these individual forces, in which the experiential part of culture is one of the main components underpinning the formation of such forces. The next concluding point elaborates the processes of change of these elements.

IV Dynamics of cultures and the processes of culture changes

The analysis using the diachronic relational approach, adapted from the Institutional Analysis Development (IAD) framework proposed by Ostrom (2005a), points out that 'cultures' are not taken-for-granted values that are static. Rather, they are dynamic normative values that are subject to changes over time, underpinned by their interrelationships with other development conditions that are also subject to changes. The findings suggest that interrelationships between development conditions (including cultures) create the continuous changes of the conditions influencing decision-makings and management outcomes. The observations regarding dynamics of culture in floodplain management in this study correspond to Friedmann's (2005b, 29) statement, namely that although the way planning is performed in each place is historically grounded, yet '... *within any given setting, planning must continuously reinvent itself as circumstances change.*'

Moreover, findings using the diachronic relational approach proposed in the integrative conceptual framework bring about the counter-thesis against a perspective of culture changes suggested by previous studies in the field of cultural studies. Douglas (1992) argued that culture changes may occur only if the conditions that underlie the processes that shape cultures are changed; and the changes of these underlying conditions have to be exposed from within, not from external imposition. Yet, the evidence from this empirical study reveals that changes of culture and outcomes regarding territorial management could be initiated by either endogenous or exogenous change-initiating factors. It is just the matter of right matching between the dimension of culture and the change-initiating factor. In other words, the findings in this study suggest that changes of culture and outcomes could be initiated if the change-initiating factor can lead to changes of the conditions that strongly influence the shaping of that particular dimension of culture.

The analysis in this study reveals that although the iterative processes of evaluation of the outcomes and institutional adaptation play a crucial role in changes of culture and planning practices and spatial development outcomes, these changes could be also triggered by exogenous change-initiating factors, such as transfers of policy, technology and discourses. This finding corresponds to Gullestrup's (2006) argument that cultural changes could be initiated not only by indigenous factors (referring to endogenous factors in this study), but also by exogenous factors. An example of this finding is the effects of the transfers of the 'fighting against water' technology and policy in the Thai case. The imported technology and policy resulted in changes of the physical conditions in relation to the degree of flood risk of the area. The changes of physical attributes then resulted in changes of the experiential part of culture and the territorial management outcomes. Based on the findings mentioned in point (III), this means that if the transferred policy creates changes of the physical attributes in relation to the perception of flood risk of the area, the policy may have significant impacts on shaping the cultural traits and the outcomes regarding the uncertainty avoidance and the social integration dimensions of culture in the area.

The impacts apply also to the changes of cultures and practices regarding the power distance and the nature integration dimensions of culture. An example of this is the strong impacts of the adoption of the environmental discourses in the Dutch case and the legislative imposition that caused changes of social structure in the Thai case (such as the abolition of the '*nai-prai*' system and the 'occupancy-by-use land' ownership regulations). These change-initiating factors resulted in changes of the core values and affected the ways people acted with regard to the power distance and the nature integration dimensions of culture in relation to management of flood-related issues. Figure 74 summarises these findings.

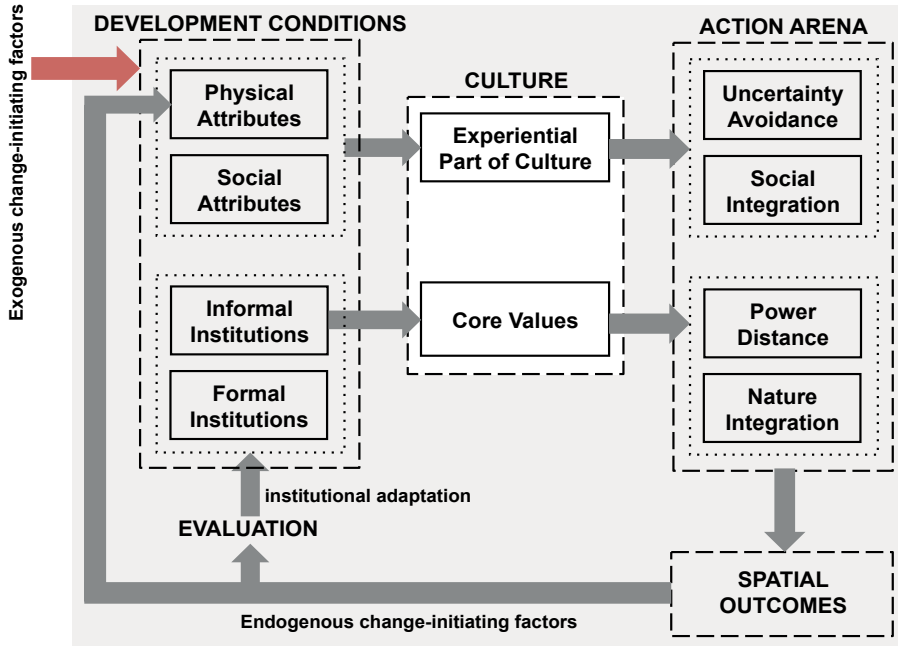

Figure 74
Dynamics of cultures and their influences in determining decision-making and outcomes in the context of floodplain management

Furthermore, the analysis reveals also the difference regarding the time it took for the changes of the outcomes in relation to different dimensions of culture to become visible after the change-initiating factor occurred. It shows that the changes in relation to the aspects of power distance and the nature integration occurred at a slower pace than the changes in relation to the uncertainty avoidance and social integration. This finding supports one of the premise of the IAD framework, namely that '*[c]hanges in deeper-level rules usually are more difficult and more costly to accomplish…*' (Ostrom 2005a, 842). In simple words, it would be more difficult and take more time and efforts for changing the core values (which are the underlying conditions influencing the territorial management outcomes in relation to nature integration and the power distance dimensions) than changing the experiential part of culture (which is the underlying condition influencing the outcomes in relation to the uncertainty avoidance and the social integration dimensions).

V *Collectivised characteristics as the essential institutional condition underpinning the effective management of flood vulnerable areas*

Apart from the requirement of 'conformity' between the policy content and the local cultures, the analysis shows that collectivised characteristics are also an essential condition that helps enhancing the delivery of desirable planning practice and outcomes in the specific context of floodplain management studied here. This is regardless of whether their core values correspond to the individualised or the collectivised type of social organisation. Evidence is the success and extensive reputation of the Dutch water management to deal with floods in one of the most vulnerable deltas in the world. This work argues that this success is underpinned by the collectivised characteristics of society in relation to territorial and water management, which is expressed at all levels of institutions. This is in contrast to the failure of the state to fight against floods in the Thai case, which was demonstrated in the disastrous damages caused by the 2011 flood. Such failure shows the result of the lack of collectivised characteristics of the society in relation to territorial and water management. This argument is supported by the fact that the same management approach that was fail to implement by the state at the regional level was successfully executed at the local level in some areas of the Chaophraya delta region (see Section 7.2.4 for more details). The analysis in Chapter 9 shows that the different actions and outcomes, both at the cross-national and the sub-national levels, are likely influenced by two specific characteristics of the local conditions. These characteristics are (i) the spatial-connectedness and (ii) the social-connectedness.

Spatial-connectedness refers to the physical conditions that enable people living in a given territory to develop the unified perceptions towards shared problems and solutions regarding the management of flood-related issues. An example of this is the nature of the Rhine-Meuse delta region in which most part of the region would be severely damaged by extreme storm surges. Zonneveld (2010, 102) stated that '*... building defences to keep areas protected from the sea was possible only through cooperation and by balancing different interests on the level of polder...*' In other words, several scholars, such as Zonneveld (2010) and de Moel, Aerts and Koomen (2011), have claimed that collective management in the Dutch delta region is essentially influenced by the necessity created by the physical characteristics of the area. This physical condition has formed the unique and widely recognised type of social organisation and management culture of the Dutch that is based on consensus seeking, namely the 'polder model'.[22]

22 The term 'polder model' was informally introduced by journalists in the late twentieth century to describe the negotiating process regarding labour relationships between the government and the trade union (van Tieldhof 2009). The term has, however, been highly contested and requires caution for using as academic reference.

Based on the above rationale, this explains why the collective management in relation to flood-related issues in the Chaophraya delta region is present in some parts of the region only. This is primarily because of the diverse physical characteristics of the region, in which some parts of it would experience substantially greater negative impacts from floods than the others (see Chapter 4). Realisation in shared problems and solutions and calls for collective management thus occurred only in certain areas in which the potentially great shared flood damages are visible.

The social-connectedness refers to the conditions that enhance collaboration between the involved actors in managing a given territory. The empirical study reveals that social-connectedness conditions relate to both cultural traits and spatial attributes in the given territory. The relationship with cultural traits refers to the predominant core values in the society, which connects to the underlying belief systems and discourses hold by the community. In other words, social-connectedness exists in the community that regards collective objectives as a priority over individual interests. The relationship with spatial attributes refers to the appropriate scale of the territory that fosters communications and/or negotiations between the involved actors. This appropriate scale is especially important to create social-connectedness conditions in the cases that management based on collective objectives is not apparent in the core values, such as in the Chaophraya delta region.

Furthermore, the findings from the empirical analysis show that the type of the institutions acknowledged by the locals is an important indication of the appropriate scale for planning. For instance, the appropriate scale may cover the whole state in the cases where the state and public laws are accredited. The scale may be limited only to the district or village level with the religious institutions being acknowledged. An example of this is the case of Pak-kred in the Chaophraya delta region, of which the local abbot was the acknowledged institution (see Section 7.2.4). In the cases where people are not connected by any institution, the effective scale for creating social-connectedness may scope down to the neighbourhood level, as it requires communication between each individual for building trust and collaboration. An example for this is the case of Lam-look-ka community, which is a rather new settlement where institutions have not been maturely developed and recognised by the community (see also Section 7.2.4). In this case, social-connectedness has gradually built-up through processes of communication and negotiation amongst the members in the gated community and the people living in the surrounding areas.

In summary, the above evidences reveal the strong connection between spatial and cultural attributes for creating the conditions for which effective territorial management regarding flood-related issues could be enhanced. The spatial attributes here refer mainly to 'scale' and 'boundary' of the territory that strengthen the perception of common problems and solutions. The cultural attributes here refer mainly to the values regarding 'trust' and 'collaboration'.

10.2 Implications of the findings for the design and implementation of spatial planning policy

The previous section summarises theoretical findings regarding the influences of culture in determining decision-making and actions in territorial management processes. Based on those findings, this section concludes with what are the implications of culture for the design and implementation of spatial planning policies. These conclusions are aimed to help raise awareness and assist planners on the significance of societal preconditions, especially cultural diversity, in the management of territories and how they may incorporate these conditions in the policy-making and implementation processes. This is in order to promote the congruity and applicability of territorial and water management policies, so that desirable outcomes aimed by the policy objectives can be expected.

The empirical study reveals the significance of 'conformity' between policy content and local culture as a fundamental condition for ensuring that the desirable outcomes aimed for by the policy objectives would be delivered in practice. However, the findings regarding the dynamics of culture imply that it is not necessary that planners limit the policies to be conforming with the existing cultures only. Rather, the dynamics of culture that interrelates with other development conditions reveal that planning mechanisms could be useful for manipulating the outcomes as aimed for by the policy objectives. This implication is essential for spatial planners, as sometimes the policy objective needs to be set in the way that does not conform to the local cultures. For instance, a collective-based management approach is fundamental for effective management of flood vulnerable areas at the regional scale. Thus, collective-based management policies are necessary, regardless of whether the local culture corresponds to the individualised or collectivised management approaches. The important point for planners is the mechanisms that would help deliver desired outcomes.

The findings mentioned in the previous section address the strong role of culture with close relationships with physical attributes and their influences on determining planning practices and spatial development outcomes. Yet, they also indicate different degrees of sensitivity of each dimension of culture to different development conditions. This implies that intervention of the development processes may require different instruments or mechanisms for different dimensions of management. Based on the main findings derived from the empirical study, three major points regarding the concerns of cultures in the processes of policy-making and implementation are addressed.

I Consideration of the scale and boundary of the management unit

The first implication derived from the findings is that it is essential that boundaries and scale of the management unit be defined with caution. Spatial-connectedness and social-connectedness are the fundamental qualities to take into consideration when defining the management unit. In the cases that these qualities do not exist or are not evident to the involved actors, planning mechanisms that help enhance these qualities are advised. These planning mechanisms include, for instance, physical interventions that help inform the actors involved about their spatial-connectedness in regards to the problems and solutions, and institutional arrangements that take into consideration the local cultures and the boundary and scale associated with the spatial-connectedness.

Institutional arrangements are not necessarily formal institutions. It could be arranged also in the form of technical and financial supports given by the public sector to the existing informal institutions acknowledged by the locals. The case of Pak-kred, in which the public sector acted as the facilitator providing technical and financial supports to the religious institutions and collaborated with other sectors, exemplifies this suggestion (see Section 7.2.4 for further detail of the case studies). The key concern is that the enhancement and support be given to the local institutions that are influential in management of the particular issues in the society. This is the main point of concern that requires special attention in planning processes, so that the making of the policy/plan and implementation actions would react upon these local preconditions accordingly.

II *Planning mechanisms to enhance conformity between planning objectives and management outcomes*

The second implication relates to the different degrees in which of influences of changes of physical attributes may influence changes in regards to each dimension of culture in floodplain management. Findings based on the empirical study suggest that spatial interventions and institutional-related measures ought to work together in order to promote the desired outcomes that planning objectives aim for in practice. This is because of the different degrees of sensitivity towards different mechanisms of each of the two dimensions, both in relation to the resource management and the social organisation. Figure 75 and Figure 76 summarise suggestions regarding possible mechanisms to improve planning practice regarding resource management and social organisation in the context of floodplain management.

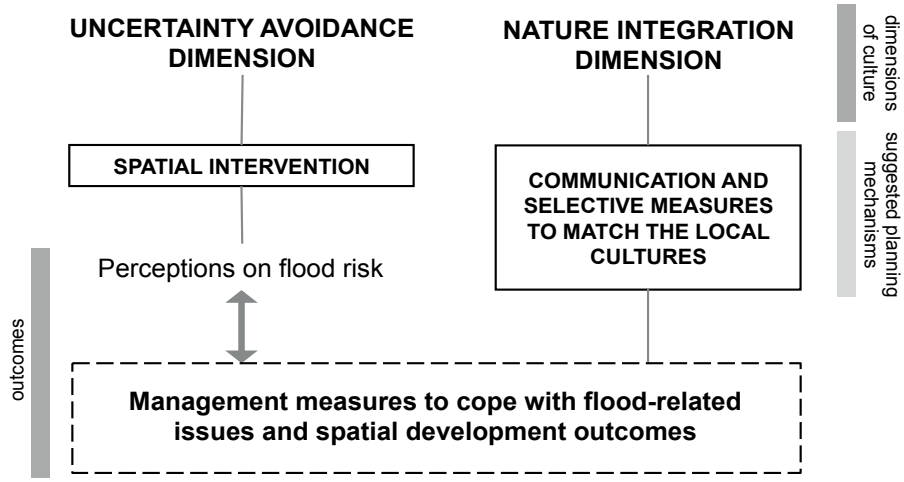

Figure 75
Suggested spatial planning mechanisms to improve planning practices in relation to the resource management aspects regarding floodplain management

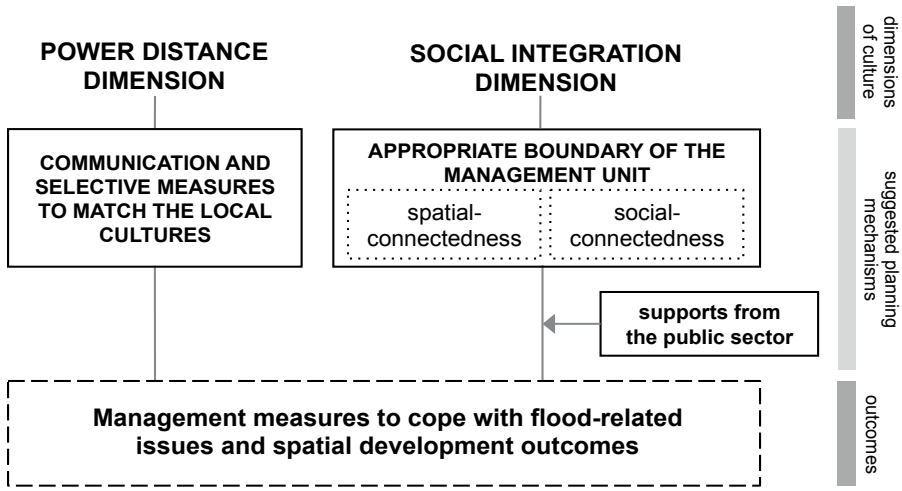

Figure 76
Suggested spatial planning mechanisms to improve planning practice in relation to the social organisation aspects regarding floodplain management

The evidence of strong influences of physical attributes on the shaping of cultures and management outcomes in relation to the uncertainty avoidance and the social integration dimensions regarding floodplain management implies that spatial intervention mechanisms could be effectively used as an instrument to shape the management culture and outcomes regarding these two dimensions of culture towards proclaimed policy objectives. For instance, people's conceptions about problem control may change through a pilot programme with spatial interventions (as shown in Figure 75). Changes of conceptions are likely if the outcomes created by those spatial interventions are evaluated as positive. People may develop conceptions about flood as tolerable or acceptable and consider flood control as unnecessary, if the pilot programme enables the living with floods with minimal negative impacts. More examples of spatial intervention mechanisms are the ways the management unit is defined and designed by taking into consideration its spatial-connectedness (as illustrated in Figure 76). This spatial-connectedness could help enhance collective-based decision-making and actions by promoting unified perception towards flood-related problems and solutions. This is further elaborated in the next chapter in the analysis of implications of cultures for the implementation of the relevant land use plans in the Chaophraya delta region.

In contrast, effects of physical attributes on the shaping of culture and outcomes regarding the nature integration and the power distance dimensions seemed rather marginal. It means that spatial interventions might not be effective for shaping the ways people conceive and act in relation to floods (whether by manipulating water or by adapting their behaviours) and distributing authorities and responsibilities amongst

actors. This implies that rather than assuming that planning prescriptions would direct planning practices and spatial development outcomes towards the way the plan aims to, it is likely more effective that planning processes incorporate existing core values, norms and traditions. This concern about local cultures in planning processes includes the processes of policy and plan making and arrangement of the institutions, such as organisation structure and authority.

Yet, it does not mean that policy initiatives or transferred policies that correspond to different management approaches than the existing cultures would necessarily be rejected and fail in practice. Based on the findings and the conceptual framework in this study, it is suggested that communication and cautious selection of appropriate measures that match local culture are the key for the success of planning practice (as shown in Figure 75 and Figure 76). More precisely, by conveying the messages that match the core values or the cultural traits of the most influential actors in each area (in the cases that the local cultures are diverse), people may accept the policy in practice, even in cases in which the policy content does not entirely conform to their cultural traits. This suggestion applies also to the selection of implementation measures that match the local cultures. This implication regarding the selective-based mechanisms makes planners be able to go beyond the limitation of conformity with the sole cultural trait in the design and implementation of territorial management policies. Example of this implication is elaborated in the next chapter in the analysis of implications of cultures for the implementation of the 'Room for the River' Programme in the Netherlands.

III *Role of planners and the awareness regarding possible consequences created by planning interventions*

Apart from the above suggestions regarding planning mechanisms, the two-way arrow in Figure 75 implies also awareness of possible consequences created by spatial interventions on changes of culture and territorial management outcomes. In other words, this suggests that implementation of spatial-related policies may create changes of physical conditions in regards to flood risk perception. This requires special attention when making and implementing a policy or plan. This is because the way people conceive and act in the management of flood-related issues is crucially sensitive to the physical conditions in relation to the degree of flood risk of the area. For instance, flood prevention measures provided by the public sector to protect highly flood-prone areas may lead to increase degrees of problem control in the conceptions of people living in those areas. This is because the reduced extent of floods is likely to result in urbanisation patterns along with activities that are sensitive to floods. These changes of the physical attributes created the conditions of which the degree

of flood risk increases. The change of the degree of flood risk triggers changes of the experiential part of culture. Actors then react to the changes by calling for management approaches corresponding with the increased degree of problem control in order to avoid uncertain situations that may cause great damages to the sensitive development patterns. This means that an increased degree of flood protection in planning is likely to result in people developing a higher expectation for flood protection in the planning. Cautious design and implementation of policies and plans with awareness about this interrelation would help minimise undesirable effects created by planning in the territorial management practice.

Apart from awareness regarding spatial arrangements, the findings also indicate the necessity for awareness regarding institutional arrangements. The analysis reveals that the direct involvement of the public authorities may not always be the preferable action. Rather, the role of the planning authorities as a facilitator to support the respected local actors or institutions to carry out planning activities is suggested in some cases. An example of this is the success case of Pak-kred management model, in which an esteemed abbot and the temple were the principal actor and institution executing the collective tasks. The municipality acted as the facilitator collaborating between all stakeholders and providing technical and financial support to the management of the flood (see Section 7.2.4 for further detail). In other words, it suggests that the key role of the planners in the cases in which the planning authority is not accredited is to identify the institutions acknowledged by the locals and provide support to them, as illustrated in Figure 76. Its role is also to promote collaboration between different stakeholders both within and across management units. This is in order to ensure the consistency and effectiveness of the management at all scales.

10.3 Reflections on the proposed conceptual framework and contributions to methodological development

As mentioned earlier, this study aims to develop a better understanding of culture regarding territorial management and exploring its implications for spatial planning, both theoretically and methodologically. The two previous sections summarise the theoretical development gained from this study. This section summarises the methodological contributions in relation to the validity, the applicability and the limitations of the conceptual framework proposed in this study to explain relationships between culture and territorial management in this work and for further studies.

In general, the empirical study carried out in Part II and Part III demonstrates a strong validity and possible applicability of the integrative conceptual framework and its key principles and components to explain the territorial management in relation to flood-related issues in the case studies. The integrative framework provides an approach for analysis that expands the understanding of culture and its influences on spatial planning to a broader extent. This is by enabling the analysis that incorporates the understanding of 'cultures' that goes beyond the scope of planning systems, organisations and instruments (which were referred to in many studies as 'planning cultures'). The integrative framework includes the non-manifest part of culture, such as traditions, values, beliefs and world views in the analysis. It also brings together a synchronic perspective and a diachronic perspective into one framework. Generally, there are two main contributions and remarks brought by the application of the integrative conceptual framework to the empirical analysis in this study, as laid out below.

I *Contributions from the integration of the synchronic and the diachronic analytical approaches*

The fundamental principles of the integrative framework based on a synchronic perspective are proven by the empirical study as relevant for explaining why policies corresponding to the similar approaches of territorial management were accepted in practice in one place, but not the other. These fundamental principles refer to the significance of the 'conformity' between policy content and local cultures and of the internal power relations (in the cases that the society is diverse and the cultural traits of the different groups are not aligned). The synchronic analytical approach helps identify the immediate possible actions in responses to the policies. This is useful especially for the analysis of transferred policy, in defining whether there is any need for adjustment of the policy for promoting the outcomes that planning objectives aim for to take place.

The diachronic analytical approach is constituted by the Institutional Analysis and Development (IAD) framework. This approach expands the understanding of cultures in previous studies, which were rather limited to the static taken-for-granted values. This analytical approach takes the social constructivist perspective to understand cultures as the dynamic socially constructed values influenced by mutual interactions between individual cognition and social framework (Othengrafen 2012). In other words, it suggests analysing culture as dynamic and interrelating with other development conditions that are subject to change over time.

The integrative conceptual framework makes the connection between physical attributes, individual cognition and social framework in territorial management more clearly visible. This is by showing that culture in relation to territorial management consists of two parts. One part is significantly affected by the core values that form social framework. The other part refers to the experiential part of culture. In the specific of floodplain management, for instance, this part of culture relates strongly with physical conditions regarding the degree of flood risk of the areas, which affect individual cognition in relation to floodplain management. The dynamics of culture and its interrelations with physical attributes inform possibilities to use spatial planning mechanisms to intervene development processes and to shape desirable spatial development outcomes. The integrative conceptual framework helps planners to identify what needs to and could be adjusted in order to achieve the outcomes that planning objectives aim for.

This contributes not only to the theoretical development in the understanding of cultures in the spatial planning discipline, but also to the methodological development for the analysis of spatial planning policy and practice. It helps improve the understanding and raise awareness about the significance of culture as one of the elements of concern in planning processes, rather than as a given constraint that limits possibilities for development. The awareness includes not only the influences of cultures on planning practice, but also the influences of the spatial consequences created by spatial planning policies on institutional adaptation. Institutional adaptation here refers to both change of cultural values (i.e. informal institutions) and arrangement of organisations and public policy (i.e. formal institutions). This view of understanding of culture as dynamics and interrelated with physical attributes, planning policies and management outcomes is important for policy analysis. It is especially crucial during this recent period in which planning around the world is facing great challenges created by rapidly changing contexts for development that have called for needs for institutional adaptation.

II Reflections on the framework for unveiling and characterising cultures regarding territorial management

There are three major remarks derived from the empirical study using the conceptual framework developed in this study. The first remark regards the contributions of this conceptual framework to the methodological development of comparative analysis. This framework offers a simplified approach to view and classify cultural traits, policies and practices in the form of ideal types. This appears considerably helpful for cross-cultural comparative studies. It is because looking at cultural traits, policies and practices in the form of ideal types helps researchers to focus better on generalising

the dimensions of culture. It helps reduce distractions from the focus of the analysis potentially resulting from the over-emphasis on specific qualities of management. This comparable form of cultural traits, policies and outcomes also supports the comparison across time periods. It enables researchers to compare whether these elements are related and change simultaneously over time in accordance to changes of the other element.

In addition, the framework suggests making use of the secondary quantitative data from the rather reliable sources that have been widely used in the cross-cultural comparative studies. These sources include, for example, cultural values derived from the World Values Survey (WVS n.d.) and the Hofstede's (2011) survey. This enables and improves the comparability of one study to other studies executed by different researchers. This includes both the studies regarding different issues of planning in the same territory and the studies of the same issue in different places. Furthermore, the use of these data also helps reduce biases possibly created through researcher's interpretation of cultures using narrative methods only. The use of the secondary data appears useful for a quick policy assessment. Yet, there are also constraints for the use of these data, which is referred to in the second remark.

The second remark regards the differences between cultural traits in relation to general aspects of management (such as from WVS and Hofstede's national cultures) and those regarding the specific aspects of territorial management; in this study, the specific aspect is floodplain management. For instance, the analysis shows a high degree of uncertainty avoidance in organisational management in Thai society, but a low degree of avoidance regarding the management of natural environment. The differences are apparent especially regarding the uncertainty avoidance and the social integration dimensions. It means that the selection of the existing cultural indicators and the use of secondary data require special cautions to ensure the relevance and minimal deviation of the indicators to explain the scrutinised aspects of the analysis. This remark refers to possible item bias created by the limitation of the available data and its consequences of the interpretation of the data (van de Vijver and Leung 1997).

Apart from the item bias, there are also critiques about the selection bias toward the highly educated and the negative association between education and acquiescent response style of the WVS (Littrell 2008). The similar critiques relating to selection bias apply also to the national cultures derived from Hofstede's surveys, of which participants were limited only amongst the IBM employees. Additionally, participants in different countries may have different response patterns, which may result in errors regarding variance of the data. However, standardisation, which may account for cross-cultural response bias, is not applied in this study. It is because different response patterns may reflect cultural characteristics (Fischer 2004). Instead, this work recommends the use of various sources of data and methods of analysis for interpreting and classifying cultural traits using this conceptual framework. Interpretive

methods, such as narrative analysis based on evidence that directly relates to the aspects of floodplain management, appear very helpful for crosschecking. However, interpretive methods require expert assessment. It is suggested that the analysis should take into account previous studies that are relevant to the aspects of analysis and executed by local experts as many as possible. In short, it should be noted that the analysis of culture-related issues is rather sensitive and expert justification is rather crucial in order to derive the reliable interpretation and analysis.

The last remark regards the use of two management typologies to explain cultures in relation to territorial management. The conceptual framework in this study proposes that cultures regarding resource management and those regarding social organisation should be analysed independently. This is because how people conceive their relationships with others and how they behave in relation to others could be different from how they develop their conceptions and interactions with nature. In other words, the framework in this study suggests that management approaches regarding the aspects of resource management and the aspects of social organisation are constituted by different sets of dimensions of culture. This is different from the ideas proposed by Thompson (2000).

The empirical analysis provides evidence that validates this premise. For instance, the analysis shows a strong symmetrical transaction in the Dutch conceptions of the human-human relationship. This means that relations between members based on ranking or grading rules is not apparent in Dutch society. According to Thompson (2000), this means that the Dutch would also develop their conceptions of the human-nature relationship as if humans and nature were equal; i.e. all living beings should be treated equally. Yet, the analysis shows that this is not quite the case when looking at the resource management approach taken in the past. In fact, the management approach predominantly employed in the service of the state in the Netherlands has been based on the *administrative rationalism*. The underlying principle of this management approach is that resources can be managed, but not needs; and humans may exploit resources as long as it does not go beyond discoverable limits of nature.

11 Application of the theoretical findings for public policy analysis

This chapter demonstrates how the findings regarding the relationships between management cultures, planning policies and territorial management outcomes and their implications for spatial planning summarised in Chapter 10 can be used for public policy analyses. This is exemplified through an assessment of policies in relation to floodplain management presently implemented in the Rhine-Meuse delta region and the Chaophraya delta region. The integrative framework and the findings derived from the research are drawn together here to present how to address concerns regarding local cultures on the design and implementation of planning policies. It also indicates foreseeable impacts that culture might have on planning practice and development outcomes. In turn, this suggests the types of planning approaches and mechanisms that planners could adopt to ensure the achievement of planning objectives and to minimise possible negative consequences. At the end of the chapter, directions for future studies required for extending the derived findings in order to increase the understanding of the relevance of culture on spatial planning are addressed.

11.1 Implications for implementation of the floodplain management policies in the case studies

Transfers of technology, knowledge, policy ideas and institutions from one place to another have rapidly increased in recent times. Reforms of the territorial management of urbanised delta regions through these transferred approaches are also taking place across the world. These transfers aim to help deal with seemingly common problems of increasing environmental challenges caused by conflicts between growing populations and limited natural resources in the fragile ecological systems of deltas. As a result of increasing transfers, the seeming convergence of territorial and water management approaches have taken place worldwide. This includes recent management trends in public policy regarding the management of the Rhine-Meuse delta region in the Netherlands and the Chaophraya delta region in Thailand.

These converging approaches refer to the territorial and water management policies based on technocratic approaches along with changing approaches towards management based on more integration with nature. In this chapter, policies corresponding to the 'working together with water' management approach are

assessed. This is in order to illustrate the possible influences of cultures on similar policies and their implications concerning policy transfers. The policies analysed in this chapter include the 'Room for the River' programme ("Room for the River" n.d.; Planning Key Decision 2006) for the Dutch case and the principle of 'floodway' and Kam-ling (referring to a water detention area) presented in the Strategic Development Plan for 2057 (DPT 2008) and the current Bangkok Land Use Plan (CPD 2013) for the Thai case.

Table 12 summarises the management objectives and measures of the selected policies that were assessed. This study argues that the actions in response to these policies are likely to be quite different in the two cases, despite the common principles they share. This is due to the distinctive local preconditions of the two delta regions, including physical and cultural contexts.

Policy/project	Launched	Organisations	Objectives	Measures
The selected policies for the Dutch case				
'Room for the River' programme	2007	Deltacommissie launched, Rijkswaterstaat and water boards executed	to deal with the excess water from river discharges without flooding	managed flood-plains, improved water channels for more storage
The selected policies for the Thai case				
Strategic Development Plan for 2057 and the present Bangkok Land Use Plan	2008/ 2013	King Rama IX's idea/ Prepared by DPT and CPD (under BMA) respectively	to mitigate flood damage in the region	land use guidelines and regulations providing water detention area and floodway

Table 12
Summary of the present floodplain management policies in the case studies
Note: The assessment of the policies for the Thai case emphasises the 'rural and agricultural conservation' zoning only.

11.1.1 Implementation of the 'Room for the River' programme in the Rhine-Meuse delta region

The 'Room for the River' programme is part of the new Delta Programme under the new water management vision in the Netherlands introduced by the Deltacommissie in 2008 (Deltacommissie 2008). It consists of various projects along the rivers, as shown in Figure 77. The management approaches present in this programme is based on the management principle of 'working together with water', in which there is a greater integration of nature and acceptance of uncertain situations associated with a low degree of flood hazard. This is evident in the inclusion of 'soft measures' in the programme, such as the 'depoldering' measure (Hendriks and Buntsma 2009; "Counting the Cost" 2012).

Figure 77
Projects of the 'Room for the River' Programme
Sources: Department of Communication for the 'Room for the River' Programme (Planning Key Decision 2006)

Despite policy statements calling for 'working together with water', the conventional management approach present in previous policies has been maintained in the programme objectives (see Section 6.1.3 for further detail). This conventional management approach refers to the collective-based territorial and water management measures that are based on a high degree of uncertainty avoidance and anthropocentric approaches that put humans at the centre of the development (referring to the 'fighting against water' management approach). The persistence of conventional approaches towards water management policies is evident in the basic premises, objectives and suggested measures present in the programme, which put water safety at the highest priority as a collective-national responsibility (Deltacommissie 2008; Planning Key Decision 2006; "Counting the Cost" 2012).

Foreseeable influences of cultures on policy practice

Based on the conclusions made in the previous chapter, the 'Room for the River' programme is likely to be accepted in practice by those who will be affected by its policies, if the policy objectives are appropriately communicated. Here, appropriate communication refers to the delivery of policy objectives that match local cultures and institutions. The argument above is supported by the findings from the empirical investigation, which suggest that 'conformity' is a requisite condition to enhance policy acceptance. In other words, although the new vision adds new management dimensions to the programme (i.e. greater nature integration and uncertainty acceptance), conventional management principles are not excluded. This conventional approach corresponds to the 'controlling of nature' technocratic management model and conforms to Dutch culture. It means that the conformity between local cultures and the underlying management principles of the 'Room for the River' Programme would motivate involved actors to accept these policies to a certain degree.

However, there are still important points of concern to improve policy practice. These points are related to instrumental changes towards greater nature integration along with increased acceptance of uncertain situations, as shown in the programme. This new type of water management measures does not conform to the 'controlling of nature' management cultures maintained in the Dutch mind set. Yet, this study argues that success in implementing the programme can be expected, underpinned by three main factors.

First, instead of putting the objectives regarding ecological conservation at the centre of the policy objectives alone, the 'Room for the River' programme emphasises the improvement of spatial quality in order to improve peoples' quality of life. This is stated clearly in the report, namely that the integration of water with other functions would '*... thereby boosting its economy, ecology and scenic value*' (Planning Key Decision 2006, 9). This shows an attempt to accommodate the new 'social-ecological integration' planning objectives, and at the same time incorporate the traditional 'anthropocentric' management cultures

and policy traditions and effectively communicate them to the public. In other words, the success to implement policies which are non-conforming with local cultures is enhanced through appropriate messages conveyed to match local core values.

Secondly, the 'Room for the River' programme offers a great variety of management measures. They range from the traditional 'controlling of nature' type of measure to the more soft measures, such as 'depoldering' and '*terp plan*', that enable more integration with water than before (Hendriks and Buntsma 2009; Planning Key Decision 2006; Woltjer and Al 2007). The diverse range of management measures shows attempts to make the policy match local cultures that may be different from the planning objectives. This is achieved by allowing contextualisation using different management measures. It means that planners might be able to motivate people living in areas with a low degree of flood hazards and flood vulnerability to follow new policies that incorporate a greater integration of nature and acceptance of uncertain situations. Yet, the contextualisation of policies is also possible in areas where the degree of flood hazard and the degree of vulnerability to floods of land uses are high. This can be achieved by selecting measures associated with greater uncertainty avoidance along with less integration with nature, in order to ensure safety of the high-risk areas.

Thirdly, the implementation of the new Delta Programme is supported by the unique Dutch social organisation model for water management. The cooperation between the authorities across sectors and levels is a fundamental cultural paradigm underlying Dutch institutions, including the new Delta Act. This institutional structure enables communication and negotiations between stakeholders with different cultures and interests (Ostrom and Janssen 2004). Through these processes, consensus amongst actors is likely take place and lead to the successful implementation of a programme, although the policy content may not completely conform to the values and traditions of all actors.

Nevertheless, this does not imply a totally smooth or suddenly successful policy implementation processes. Despite the integration of conventional management principles into new planning policies, the new management approach in the Netherlands is associated with a reduced degree of control, both of humans over nature and of the state over other actors. Although the new management approach has likely been accepted by the actors affected by the policies in practice, it is also likely that the policy implementation may involve unpredictable environments and challenges during the beginning of the process. This is because slight changes in management approaches concerning planning policies would necessitate institutional adaptations, in order to enable local cultures to become aligned with the new management approach. As concluded from the findings of this study, culture change occurs through iterative processes of evaluating outcomes and the adaptation of institutions. This means that processes of cultural change take time to become established. Iterative processes of adaptation in the Dutch case are exemplified later in this section as possible consequences of policy implementation.

Evidence supporting the analysis of foreseeable influences of cultures

Although the 'Room for the River' Programme was launched only a few years ago, parts of the aforementioned foreseeable influences of cultures on the implementation of the programme are confirmed by the initial outcomes in Overdiep. Depoldering in Overdiep - a town in the province of Noord-Brabant - already took place under processes of negotiation and cooperation across different levels and sectors of government and actors. It turned out that approximately half of the households and business chose to relocate on a newly built *terp* [translation: artificial dwelling mound] in the area where polders will be lowered; the other half decided to move to safer areas ("Counting the Cost" 2012). Those who agreed with the '*terp plan*' and continued to live on a newly built *terp* received subsidies from the government to assist with adapting to new conditions.[23] The government also assures compensation for losses from occasional floods, with an expected frequency of 1 in 25 years. This shows the success in implementing the new floodplain management policies, underpinned by cautious design measures and selection of policy objectives, management measures and communication measures in the Dutch case.

Possible consequences of policy implementation in planning processes

Based on the conclusions made in Chapter 10, it is likely that the initial success in implementing a new management approach that allows occasional inundation to occur in some areas may also result in a wider acceptance of the new approach in other areas in the long run. This can be expected if the outcomes are positively evaluated. It means that the positive outcomes may trigger changes in public perceptions by reducing people's anxiety in relation to possible uncertainties caused by floods. Therefore, the level of acceptance necessary to put policies into practice can be catalysed by lessons provided by the learning processes and practices of successful pilot projects. With regard to this, communicating the success of policy practices to the general public is a key element for enabling the widespread acceptance of new policies. Additionally, spatial arrangements that enable greater contacts between humans and low-hazard floods would create an environment where people could learn how to adapt to and incorporate nature to deal with uncertain situations. These issues correspond to the argument that changes in cultures regarding the uncertainty avoidance dimension may be achieved through spatial interventions that have the potential to change people's experiences and perceptions of the degree of flood risk, as shown in the development within Khlongluang in the Thai case (see Section 7.1.1).

23 *Terp* is an artificial dwelling mound, created to provide dry ground during high tide or river floods. It was a traditional measure for flood management in many parts in the Netherlands, including the Rhine-Meuse delta before dikes and polder system became the main flood management measure the thirteenth century ("Room for the River" n.d.).

Furthermore, a lesser degree of state control in water management and the greater roles of individuals may call for the establishment of new rules and institutions to accommodate these changes. However, it is important that new rules and institutions are formed with great attention to local cultures. For instance, a system of insurance may be an option of new institutions to involve individuals' responsibilities regarding the management of flood-related issues. Yet, underlying societal conceptions that water safety is a collective responsibility that concerns everyone ought to be incorporated in the new system. This means that an entirely privatised insurance system, which may work somewhere else or is effective in dealing with other aspects, may not fit with the collective-based conception and management culture of the region. This is because the role of the public sector in territorial and water management in the Rhine-Meuse delta region has been substantial for a long period of time. To put this in simple terms, it seems necessary that new rules and institutions incorporate this local culture, so that desirable outcomes that planning objectives aim for can be expected.

11.1.2 Implementation of the relevant land use plans in the Chaophraya delta region

The plans analysed in this section include the Strategic Development Plan for 2057 (DPT 2008) and the present Bangkok Land Use Plan (CPD 2013), which is a revision of the 2006 Plan. Figure 78 illustrates the Strategic Development Plan for 2057, into which land use zones of the Bangkok Land Use Plan are integrated. The plans illustrate specific types of land use and regulations that provide water detention areas [*Kam-ling* in Thai] and floodway to the Bangkok Metropolitan Region (i.e. the Chaophraya delta region in this study). This specific type of land use is called 'rural and agricultural conservation'. This type of land use is assigned to selected areas in the region. Land uses that are permitted for development of these areas are an especially low-density residential use and agricultural use only.

This land use type is developed in accordance with King Rama IX's speech to integrate the idea of 'working together with water' to the previous management approaches. Interventions such as water detention and floodways are attempts to cooperate more with nature and accept a higher degree of uncertainty compared to most of the measures currently in use for managing flood-related issues in the Chaophraya delta region.

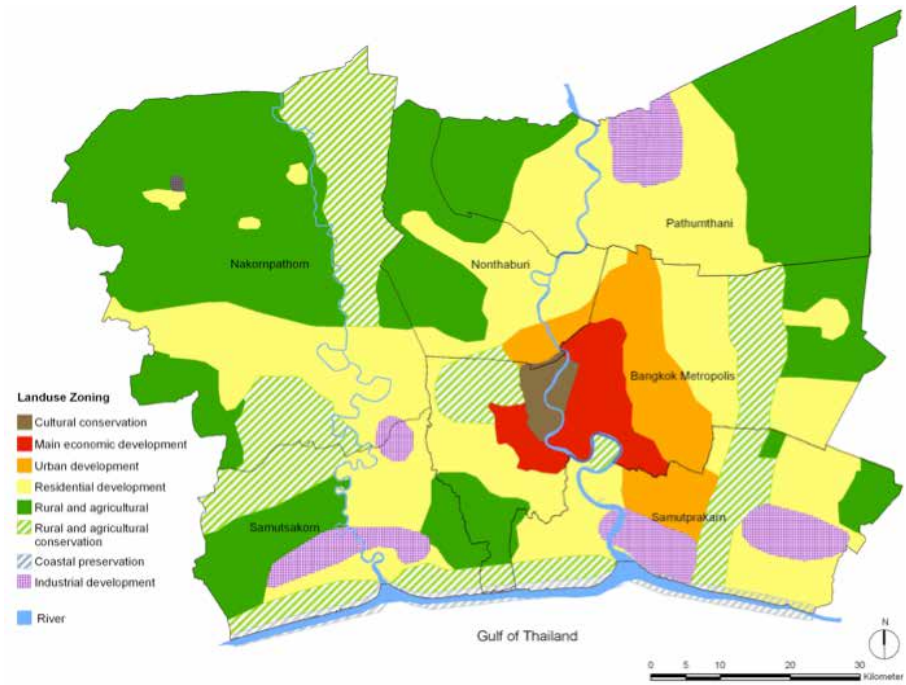

Figure 78
Land use guidelines in the Strategic Development Plan for 2057
Source: Reproduced based on maps in the 'Strategic Regional Plan: Bangkok and Vicinities' (DPT 2008)

Foreseeable influences of cultures on policy practice

Based on the conclusions elaborated in the previous chapter, the idea of being more integrated with nature, as manifested in the current plans as the 'rural and agricultural conservation' land use type, is likely accepted by the general public. This is supported by two main factors. First, this management principle conforms to the core values and traditions regarding resource management within the region, as analysed in Chapter 5. Second, the empirical findings reveal the significant role of respected leaders or trusted institutions in promoting collective-based decision-making processes in the Thai cultural context. This corresponds to the observations in Shigetomi (2003) and Hanks (1962, 1972), namely that in the Thai social organisation model '... *stability of the relations is assured by "love and respect"*...' These particular types of land use in the land use plan were developed in accordance with the ideas initiated by King Rama IX, who represents an institution that receives widespread respect and trust from the public. As a result, acceptance of the King's ideas by the public is likely.

However, variations in the degree of acceptance of the plan in practice by those directly affected by the implementation of the plan are likely in different parts of the region. This is because the degree of flood risk is fairly diverse across the region. The diverse degrees of flood risk are caused by (i) different physical attributes within different parts of the region that create different levels of flood exposure and (ii) different degrees of vulnerability to flooding created by diverse economic activities. The empirical findings reveal that these differences are likely to create distinct local cultures in the management of flood-related issues in different areas. As concluded in the previous chapter, 'conformity' is a requisite condition to enhance policy acceptance in practice. This means that the possibility that the plan will be accepted in practice would depend greatly on the local cultures of the most influential actors in a particular area.

The diverse cultures regarding floodplain management in the Chaophraya delta region can be roughly classified into two main groups. The first group corresponds to the social-ecological integration management approach. This type of culture is aligned with the traditional core values underpinned by normative Thai belief systems. The second group corresponds to the anthropocentric management approach, which presents the relatively new values influenced by recent changes in physical, social and institutional conditions within the region. The empirical analysis in Part II shows that the traditional core values tend to be better maintained and influence management practices in areas in which urban settlements took place before the period of administrative modernisation and the introduction of new land policies at the turn of the nineteenth century. These urban areas refer to the present CBD of Bangkok located to the east of the Chaophraya River and most areas on the west of the river. The institutional changes have generated significant changes in cultures and management outcomes. Land development after the institutional transformation was based more on management approaches associated with a high degree of uncertainty avoidance through the control of nature. Soon after the transformation, urbanisation began to expand into naturally highly flood-prone areas, mainly on the east of the Chaophraya River.

Based on the principle of 'conformity', the plans tend to be more accepted in practice in the areas in which urban settlements took place before the institutional transformation at the turn of the nineteenth century. In other words, the implementation of the plan in the western areas of the region is likely to be facing minimal resistance. One important factor here is that the management approach present in the plan is not in conflict with the local cultures there (see Section 7.2.4 for the analysis in detail). Areas that are most likely to present difficulties in accepting new plans in practice are new urban areas in the eastern part of the region where the 'rural and agricultural conservation' land use type is assigned. This is to make use of natural floodways as managed floodways during flooding periods. This idea does not conform to the mentality of locals living in new settlements regarding uncertainty avoidance dimension. People who live in these areas expect a high degree of flood prevention in which uncertain situations created by floods

are minimised. This is because the geographical characteristics related to land use here are fairly vulnerable to floods. As a result, this is likely to result in difficulty in planning practice in these areas. Land development in conflict with the regulations wherever a void of laws exists can be expected.

Evidence supporting the analysis of foreseeable influences of cultures

How people responded to the Bangkok Land Use Plan during the public hearing process provides evidence that supports the expectation of different effects created by variations in local cultures regarding the acceptance of the social-ecological integration management approach of the plan. The rather strong degree of disagreements towards the restricted land use regulations of the 'rural and agricultural conservation' land use zones was observed in several areas in the eastern part of the region (such as in Minburi, Nong-jok, Khlong-sam-wa districts), but not in the western part (such as in Talingchan and Bangkhuntien) ("Revision of the Bangkok Land Use" 2012). This occurred despite of a greater need to restrict certain types of land development in the east compared to the west, due to the geographical conditions of the eastern areas which are natural floodplains. Recent large-scale residential development projects taking place in the restricted areas within the eastern part of the region also illustrate the aforementioned foreseeable effects regarding possible conflicts concerning land uses between the governmental plan and the spatial development outcomes wherever a gap in planning regulations exists.

Suggested measures to improve conformity between planning objectives and territorial management outcomes regarding resource management approach

The findings regarding dynamics of culture relating to territorial management suggest that it is possible to achieve planning objectives that do not completely conform to the local culture in policy practice. The argument here is that although conformity between policy content and local culture is an essential factor for the achievement, cautious design practices and selection of implementation measures to match the local conditions in different areas may help improve planning practice in relation to the 'working together with water' principle in the land use plans.

The Dutch experiences mentioned in the previous section seem to offer relevant ideas for promoting policy acceptance in the Thai case. A great variety of management measures, ranging from 'controlling of nature' to 'adapting together with nature' types of measures, would enable successful implementation of the 'working together with water' principle in the land use plans, both in the west and the east of the Chaophraya delta region. To put this in simple terms, the ideas and regulations aiming to regulate development based on the 'rural and agricultural conservation' type of land use may be well suited for territorial management measures in the western part of the region. On the other hand, developments in the eastern areas may call for management measures

that provide a greater degree of flood control. This is because people in the east tend to have values reflecting a higher degree of uncertainty avoidance than those in the west. An example of these measures is the construction of multi-purpose water diversion channels, which would allow for better control over water flows and requires less restrictive land use restrictions. In short, it is suggested here that instead of only using land use restrictions, the plan can include different types of management measures, as it would enable the contextualisation of planning policies to match different local preconditions. The various types of measures would help reduce resistance to the policy implementation.

However, it is important to note that although transfers of experiences and policies from the Dutch case to be employed in the Thai case appear to be useful, local preconditions in the two delta regions are rather distinctive. The use of the same management policy approaches and measures thus raises different points of concern. One of the major concerns is their significantly different cultures in relation to collective-based decision-making and actions. This issue requires special attention to design practices and the implementation of the plans or the adjustment of transferred management approaches and policies in the Thai case. The empirical findings point out a lack of elements to enhance collective-based decision-making and actions in Thai management institutions. The lack of collectivised characteristics in Thai floodplain management approaches is argued here as being influenced by cultures embedded in the region. These cultures are underpinned by the norms and values of traditional Thai belief systems and a lack of a perceived threat from flooding shared by actors at the regional level due to the characteristics of the land and floods in the region.

Despite the presence of public hearings in the process of policy-making in current planning processes, usually neither a consensus regarding policy premises is achieved, nor the possibility for negotiations and the contextualisation of policies in the implementation process is provided. To build up or enhance collective-based decision-making and actions in this case, spatial interventions aiming to promote a more unified perception of flood-related problems and solutions is suggested. It can be achieved through increased awareness of spatial-connectedness and social-connectedness within the management units being defined. This suggestion is based on the findings from the empirical analysis in this study. It suggests that the effectiveness of managing flood-related issues at the regional level could be improved through encouragement of greater cooperation between smaller local-scale management units than units at the regional scale. Regarding small management units, the territorial boundaries and a cohesive organisational structure for the management unit need to be defined with cautions. This can be achieved by paying special attention to the physical and institutional conditions of the area.

The suggestions above correspond to observations and suggestions made in previous studies. Shigetomi (2003), for instance, indicated the weakness of collective-based management approaches in the Chaophraya delta region as resulting from a mismatch between regional entities receiving outside resources and the system guiding collective actions among local people. It was observed that the indigenous social organisations and the formal administrative units did not coincide geographically. This indicates the difficulties that development agencies face when implementing their programs in the delta region. Given such conditions, Shigetomi suggests that the local administrative units and their formal leaders should act as intermediary agents in the delivery of outside resources and, at the same time, as facilitators who may identify local people expected to form the core of an organisational process.

Furthermore, the empirical findings show that the degree of trust in public authorities regarding management of flood-related issues in the Thai case is much lower than that of the Dutch case. Evidence shows that Buddhist temples were one of the most influential institutions that underpinned trust building and collective-based decision-making at the local level (Shigetomi 2003). The important role of temples was also present in water management initiatives undertaken in Pak-kred during the flooding event in 2011 (see Section 7.2.4). This means that it is essential to take informal institutions into consideration when defining the boundaries of a management unit as well as in the processes of policy making and implementation. The jurisdictional boundaries of a management unit should correspond to the areas of influence of institutions acknowledged by the locals. Involving these institutions in policy implementation processes would increase cooperation received from the locals.

However, the role of traditional institutions like temples is rather limited in new urban areas. But these new communities, mostly gated communities, usually form informal community committee which are in charge of the general management of the community. In this case, it is suggested that public authorities may help also strengthen the competence of existing community committees in the management of flood-related issues. They may provide supports, either technical or financial, to these local institutions as necessary. Additionally, planning agencies could play the roles of facilitators and moderators by coordinating with all these management units and other governmental bodies to ensure the consistency of management across different regions and sectors.

Ensuring coordination amongst different sectors is particularly important for floodplain management in the Chaophraya delta region. This is because current territorial and water management in the region are operated by many governmental bodies. These agencies adopt different management approaches, which are explained in the following paragraphs. Thus, coordination appears to be essential in ensuring consistency between management measures and actions executed by different authorities. This is in order to minimise undesirable changes in flood risk perceptions

and management cultures possibly triggered by changes in spatial conditions, which might result in undesirable development outcomes, as explained earlier.

Concerns regarding institutional adaptation

Currently, the leading authorities for flood management issues are the Royal Irrigation Department (RID) and the Department of Public Works/the Department of Drainage and Sewerage (DDS) in the municipalities. The management traditions of these authorities correspond to the anthropocentric management approach, by which measures to control water are predominant. This management approach does not conform to the idea of 'working together with water' observed in the land use plans, which aims to adapt human behaviours and land use patterns. It was also observed that the Department of Public Works and Town & Country Planning (DPT) currently has a very limited role and authority in the management of flood-related issues in the Chaophraya delta region.

A foreseeable consequence of the conflict shown above and the limited role and power of the DPT is that if its authoritative structure remains unchanged, planning policies and measures undertaken by the state to cope with floods based on a high degree of control over nature are likely to continue predominant. In Chapter 10, it is concluded that changes in physical attributes that contribute to changes in flood frequencies, vulnerability to flooding and flood risk perceptions may result in changes of cultures relating to the management of flood-related issues. In other words, the continuation of governmental planning practices based on 'controlling of nature' approaches is likely to result in changes of cultures regarding the public's perceptions and their reaction towards more uncertainty avoidance and anthropocentric approaches. As a result, land use restrictions in highly flood-prone areas tend to be less effective over time. This is because the lower frequency of floods is likely to trigger changes in flood risk perceptions that would result in urban expansion into those areas.

According to the conclusions in Chapter 10 about institutional mechanisms for improving planning practice regarding nature integration dimension, it is essential that the authority of agencies that have similar management approaches to the land use plans is strengthened. The agencies involved in territorial and water management in the Chaophraya delta region that employ a social-ecological management approach include, for instance, the Department of Town and Country Planning, which has been merged with Department of Public Works in 2002 (DPT n.d.), and the Ministry of Natural Resources and Environment (MNRE). The underlying management principles of these agencies correspond to the 'adapting together with nature' and the 'living with nature' types of management. It means that increasing the accountability and authority of these agencies may help enhance the success of policy implementation and conformity between policy objectives and management outcomes. This can be achieved through the adjustment of organisational structures and enforcement of planning policies, laws and regulations.

New water management organisational structures and regulations were launched in 2012. The new institutions are significantly influenced by the current Dutch water management model (see Section 6.2). The new organisational structure shows the increased roles of the DPT and the MNRE to a certain degree. This implies that the successful implementation of plans and policies corresponding to the 'working together with water' principle is likely to be enhanced by the new institutional framework. Yet, the predominant role of the prime minister and a high degree of centralised authority held by the new institutions may impede the successful implementation of plans and policies. This would be the case if the values and management cultures of these predominant sectors did not conform to the 'working together with water' management approach.

11.1.3 Implications regarding transfers of ideas and policies across cultures

In summary, the analysis in this chapter reveals that although recent planning institutions in the two delta regions seem to have common management approaches, the distinctive responses towards these seemingly common management approaches are to be expected. These distinctive responses are underpinned by the different physical and cultural conditions of the two regions. To enhance the delivery of outcomes that policy objectives aim for, different planning mechanisms are required in each case. This implies that a greater achievement of planning objectives and positive outcomes could be expected if planners pay special attention to and are judicious in selecting and adapting transferred ideas, institutions or policies. This is because transferred ideas, institutions or policies may be understood and implemented differently from the original ones when applied in places associated with a different cultural context. However, policy transfers are still considered useful for dealing with seemingly common problems. It requires that planning activities be based on an awareness of influences of culture on shaping decision-making and actions in territorial management processes. Important aspects of concern and the possible consequences resulting from policy implementation could be envisaged using the conceptual framework developed in this study. This increased cultural awareness in planning would help reduce negative effects possibly generated by a lack of alignment with local cultures and improve the performance of planning practices.

11.2 Directions for future studies

The empirical investigation in this study provides theoretical developments to the understanding of the interrelationships between culture, planning policy and territorial management outcomes as well as the implications for spatial planning. Yet, this study includes the analysis of only two regions. It appears necessary to incorporate more case studies for further investigations based on the integrative conceptual framework proposed in this study before deriving any generalised conclusions. This is in order to examine whether the experiences found in the two selected regions correspond to those that occur in the other cases, and whether the framework is valid and applicable to explain floodplain management issues in the different contexts.

In addition, the study analyses the relationships in the specific context of floodplain management. Application of this framework to other aspects of territorial management other than flood-related issues is suggested. This future research is expected to help improve the tentative framework developed in this study to be applicable for the analysis of a broader scope of spatial planning policies outside of those in relation to flood-related issues.

A study that includes more case studies and other aspects of territorial management based on the integrative conceptual framework developed in this study would contribute to the theoretical development regarding an understanding of the significance of culture in territorial management processes and its implications for designing and implementing spatial planning policies. It would also contribute to methodological developments by showing how the integrative framework could be adjusted in order to improve its validity and applicability for the analysis of spatial planning policies.

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24 The translation of references from Thai language into English is done by the author. The original title in Thai is put in bracket to make the references to match in-text citations and easy to find from the alphabetical sorting list.

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Annexes

A - 1 Data from international surveys

A - 2 Interviews with local residents

A - 1 Data from international surveys

Table 13 presents the list of selected parameters taken from international surveys that are used for the analysis at the cross-national level in Chapter 5. They are used for interpreting cultures regarding floodplain management of the two case study regions. The parameters are grouped here in accordance with four dimensions of culture for analysis proposed by this study (see explanation of the four dimensions in Section 3.3.2).

These parameters are taken from two sources, which are the Hofstede's (2008, 2011) study on national and organisational management cultures and the World Values Surveys (WVS n.d.). The 'Code/Source' column shows the code of indicator in Hofstede's studies and the code of questions in the WVS. Full questionnaires and results for the two sources are available online on http://geert-hofstede.com/national-culture.html, http://www.geerthofstede.nl/research--vsm and http://www.worldvaluessurvey.org/index_surveys.

It should be noted that these parameters are secondary sources of data. They are cultural indicators carried out based on different emphasis from this work. Thus, the degree of relevance to explaining cultures in particular regards to flood management may vary. This difference is indicated in the 'Relevance' column by letters L, M and H, which represent the low, medium and high degree of relevance. These different degrees of relevance are also presented in diagrams presented in Chapter 5 in different sizes (small, medium and large bubbles).

Figure 79 shows comparisons between cultural values in the Netherlands and Thailand taken from Hofstede's studies (Hofstede 2011). Figure 80 summarises the values in regards to the questions taken from the WVS (n.d.) that are used for analysis in this study. Each diagram shows the percentage of respondents in the Netherlands, Thailand and the average values of all the countries surveyed towards the cultures compared.

Dimension of culture	Parameter	Code/ Source	Relevance
Uncertainty avoidance	Uncertainty Avoidance Indicator	UAI Hofstede	L
	The type of people that avoid anything that might be dangerous (living in secure surroundings is important) is (1) very much like you, (2) like you, (3) somewhat like you, (4) a little like you, (5) not like you, or (6) not at all like you?	A 191 WVS	M
	The type of people that would like to have an exciting life (Adventure and taking risks are important) is (1) very much like you, (2) like you, (3) somewhat like you, (4) a little like you, (5) not like you, or (6) not at all like you?	A 195 WVS	M
Nature integration	The type of people that care for nature (looking after the environment is important to this person) is (1) very much like you, (2) like you, (3) somewhat like you, (4) a little like you, (5) not like you, or (6) not at all like you?	A 197 WVS	H
	Which of the following statements comes closer to your own point of view when discussing the environment and economic growth? (1) Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. (2) Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent. (3) Other answer.	B 008 WVS	H
	To which extent would you agree to an increase in taxes if the extra money were used to prevent environmental pollution? (1) strongly agree, (2) agree, (3) disagree or (4) strongly disagree	B 002 WVS	M
Power distance	Power Distance Indicator	PDI Hofstede	M
	What do you think about having a strong leader who does not have to bother with parliament and elections as a way of governing the country? (1) very good, (2) fairly good, (3) fairly bad or (4) very bad	E 114 WVS	H
	What do you think about having experts, not government, make decisions according to what they think is best for the country as a way of governing the country? (1) very good, (2) fairly good, (3) fairly bad or (4) very bad	E115 WVS	H
	What do you think about having the army rule as a way of governing the country? (1) very good, (2) fairly good, (3) fairly bad or (4) very bad	E 116 WVS	H
	What do you think about having a democratic political system as a way of governing the country? (1) very good, (2) fairly good, (3) fairly bad or (4) very bad	E 117 WVS	H
	To which extent would you agree that the government should reduce environmental pollution, but it should not cost me any money? (1) strongly agree, (2) agree, (3) disagree or (4) strongly disagree	B 003 WVS	M

>>>

Dimension of culture	Parameter	Code/ Source	Relevance
Social integration	Hofstede's Individualism Indicator	IDV Hofstede	M
	To which extent do you agree that 'work is a duty toward society'? (1) strongly agree, (2) agree, (3) neither agree nor disagree, (4) disagree or (5) strongly disagree	C 039 WVS	M
	The type of people that care for their well-being (it is important to help the people nearby) is (1) very much like you, (2) like you, (3) somewhat like you, (4) a little like you, (5) not like you, or (6) not at all like you?	A 193 WVS	H
	How would you place your views with the statement (on the scale ranging from 1- completely agree completely with statement A to 10 - completely agree completely with statement B) A: Private ownership of business and industry should be increased B: Government ownership of business and industry should be increased	E 036 WVS	M
	How would you place your views with the statement (on the scale ranging from 1- completely agree completely with statement A to 10 - completely agree completely with statement B) A: The government should take more responsibility to ensure that everyone is provided for B: People should take more responsibility to provide for themselves	E 037 WVS	M
	To which extent would you agree to an increase in taxes if the extra money were used to prevent environmental pollution? (1) strongly agree, (2) agree, (3) disagree or (4) strongly disagree	B 002 WVS	M

Table 13
Parameters used for analysis of expressions of culture in floodplain management at the constitutional level

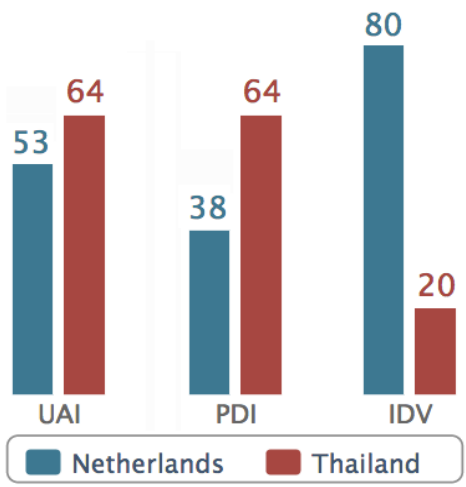
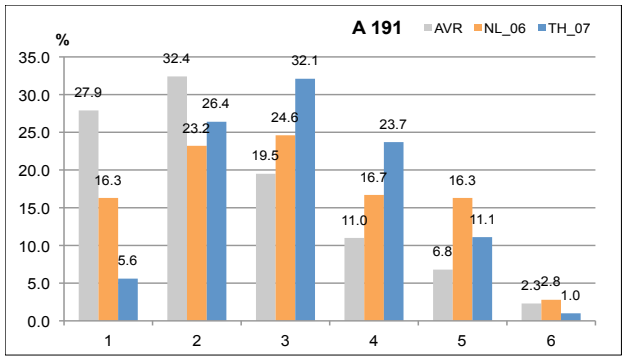


Figure 79
Comparison of cultural values taken from Hofstede's studies on national culture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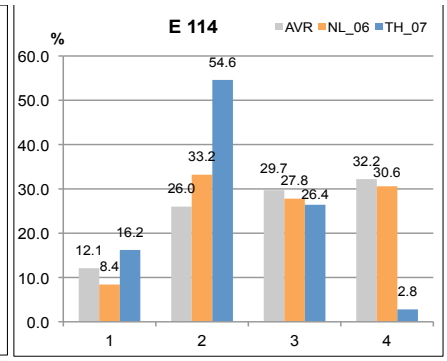
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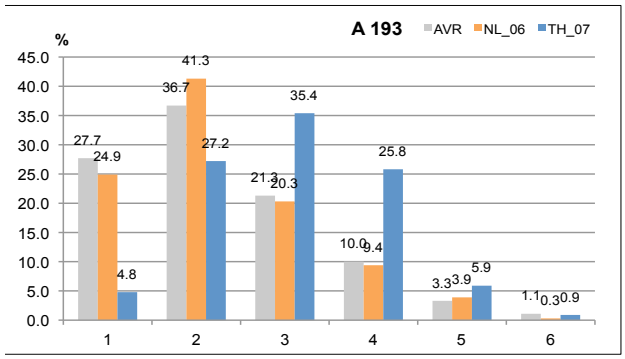
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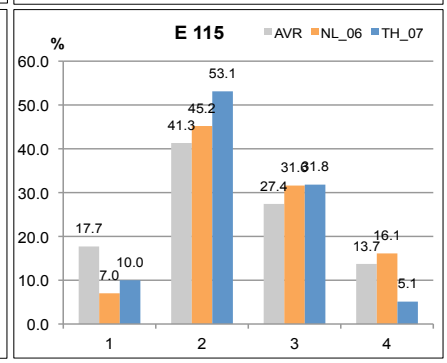
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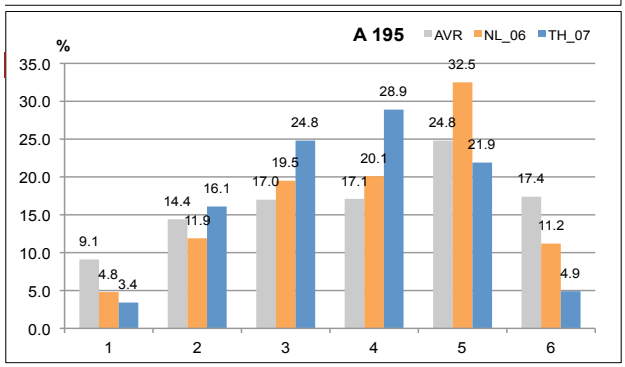
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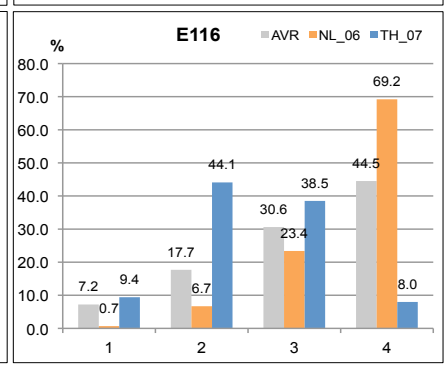
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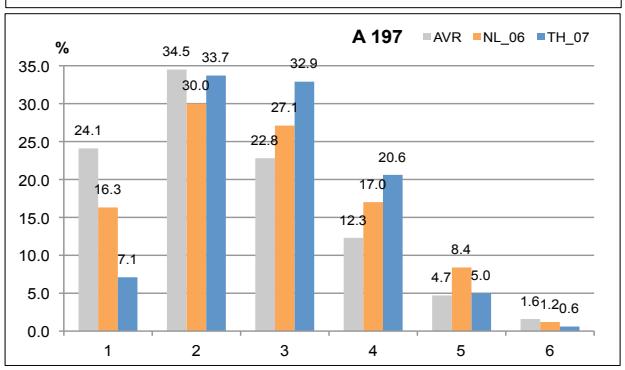
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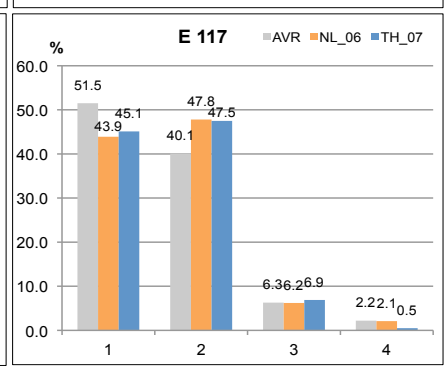
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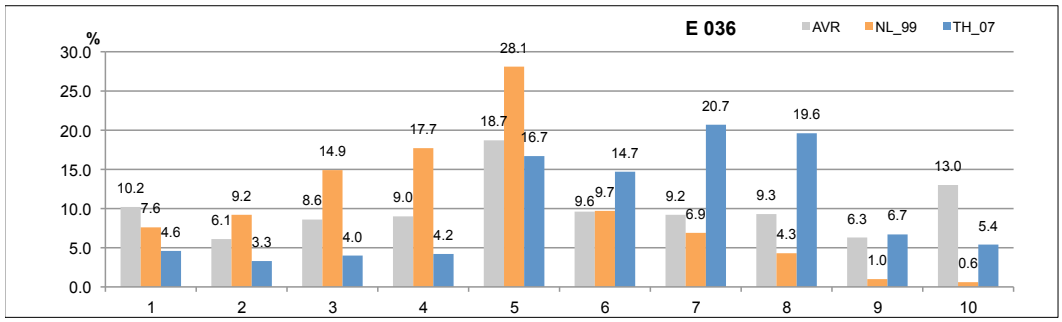

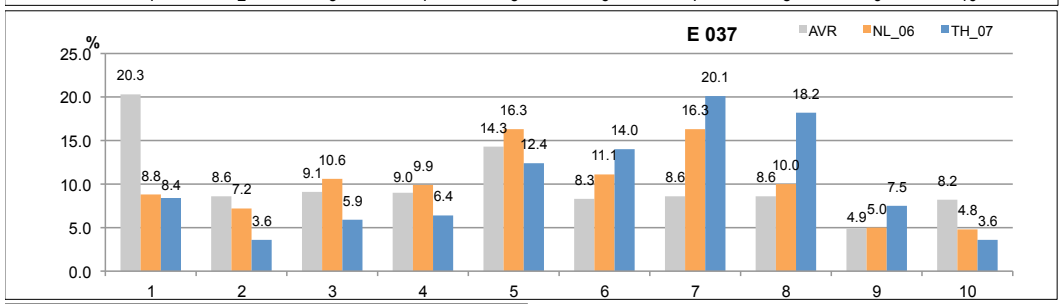

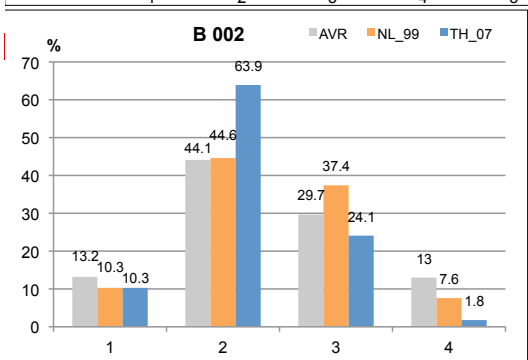

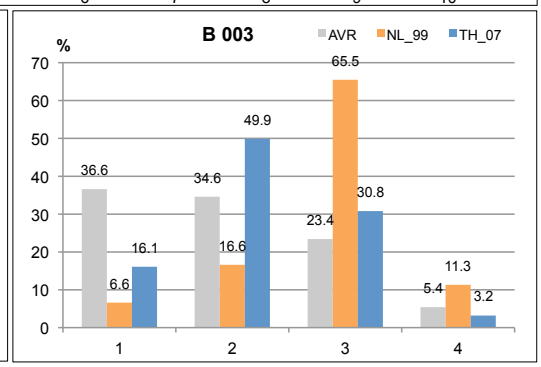

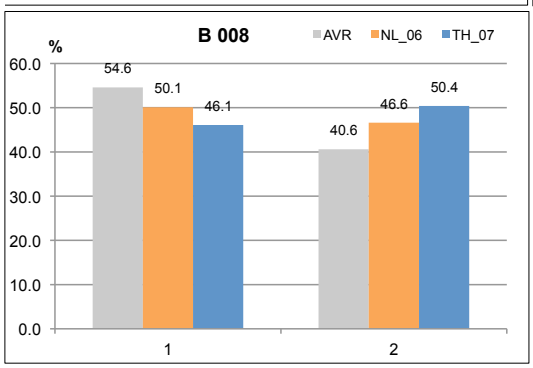

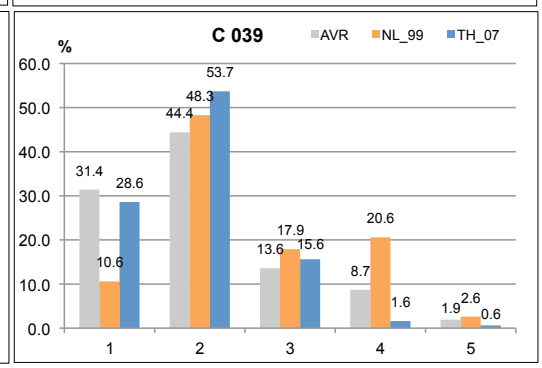

Figure 80
Comparison of values in the WVS
(on both left and right pages)
Note: The legends on the top-right of each diagram indicate the year of data surveyed

A - 2 Interviews with local residents

Semi-structured interviews are carried out in this work to collect information on local cultures and practices regarding territorial and water management in regards to flood-related aspects in different districts of the Chaophraya delta region. This information is used for the analysis at the sub-national level. The interviews are composed of four parts. Questions in the first part ask respondents using various statements about their values regarding the human-nature relationship and the human-human relationship. These statements are listed in Table 14. They represent values in relation to the four dimensions of culture proposed in this work. Questions for each dimension of culture consists of two statements. One statement relates to a general level of conceptions of the human-nature relationship and conceptions of the human-human relationship. Another statement relates to a specific level of conceptions in regards to natural resource and environmental management. Distinguishing the values into two levels is important for this study. This is because it helps to understand whether general core values correlate to particular cultures and practices in regards to floodplain management.

Statement	Dimension of culture
1) Everything in this world is subjected to changes and is uncertain. (translation: Anija, which is a Buddhist principle)	Uncertainty avoidance
2) Humans can avoid natural disasters because nature has certain patterns that are predictable.	Uncertainty avoidance
3) By integrating with nature, human can understand the world better.	Nature integration
4) We do not need to maintain/take care of any natural substance that is not useful for human life.	Nature integration
5) Human are interdependent; we can survive only if we live together.	Social integration
6) Natural resources deteriorate because they belong to public, not any individual. Thus, nobody takes a good care of them.	Social integration
7) Everyone should be treated equally, no matter of their social status.	Power distance
8) Management of natural resource is not everyone's responsibility, but a responsibility of specific groups of people and/or public authorities.	Power distance

Table 14
Statements asked in the first part of the interview

The second part asks about respondents' attitudes towards various public policies, approaches or measures for management of flood-related issues. This is also to investigate values in relation to the four dimensions of culture proposed in this work, as it is done in the first part. The results derived from the second part of interview present values that are more specific to the aspect of floodplain management and planning. Table 15 lists management policies/approaches/measures asked in the interviews. They represent different ideal types of resource management and social organisation. Respondents were asked whether they agree with those management policies, approaches and measures.

Management policy/approach/measure	Ideal type
1) Construction of flood prevention measures, e.g. large-scale dams, permanent dikes along rivers and canals water pumping stations	Controlling of nature type
2) Temporary installation of sand bags or other types of flood barrier and/or water pumps during flooding periods	Manipulating of nature type
3) Land use zoning and regulations for land development in flood vulnerable areas	Adapting together with nature type
4) Forest or mangrove reforestation to giving back an environmental balance, aiming to mitigate flood damage	Living with nature type
5) Temporary installation of elevated footpaths in inundated areas	Living with nature type
6) Governmental provision of necessary commodities (such as food/raised-beds/boats) to people being affected by flood	Dependent type
7) Long-term territorial and water management planning suggested by experts	Hierarchical type
8) Regulations for open space ratio in private land to promote collective permeable land	Individualistic type
9) Management approach that minimises loss at the regional level, e.g. to limit damages to certain areas and provide compensation to those areas	Communal type

Table 15
Management policies, approaches and measures asked in the second part of the interview

The third part collects information on facts in regards to degree of flood exposure of the area where respondents live and how flood directly affected them in the past. It asks also their perceptions in regards to degree of flood risk of the area and their concerns about floods in relation to location choice for development. This part also collects information on measures the respondents used to cope with floods in the past. This is in order to investigate the management type respondents expressed at the operational level. Table 16 shows the list of measures to cope with flood asked in the interviews whether the respondents have used them. These measures represent different ideal types of resource management and social organisation proposed in this work.

Management measure	Ideal type
1) Installation of permanent flood barrier	Controlling of nature type
2) Installation of sand bags or other types of temporary flood barrier and/or water pumps during flooding period	Manipulating of nature type
3) Adjusting landscape in order to make the area suitable for living during flooding period (e.g. raised-bed orchards)	Adapting together with nature type
4) Building a house on stilts or use less-vulnerable material for flooring on the first floor in order to reduce flood damage, moving commodities to upper level that was safe from floods, having a boat or a less-vulnerable car (e.g. a van) that can be used during flooding	Living with nature type
5) Asking for helps and support from the government when flood occurs	Dependent type
6) Leaving flood problems to experts to manage them	Hierarchical type
7) Using measures to prevent or to mitigate flood damage for your own properties only	Individualistic type
8) Cooperating with other people in their community level to cope with floods	Communal type

Table 16
Management measures asked in the third part of the interview

The last part of the questions asks about general socio-economic information of respondents. This information includes age, occupation, income, education and land ownership. This information is used for analysing if social attributes have significant influences on shaping local cultures and practices in floodplain management. However, an analysis of the data shows that influences of social attributes on shaping of local cultures and practices is not evident. But it should be noted that an analysis based on a larger number of respondents is necessary before drawing conclusions.

Biography

Suwanna Rongwiriyaphanich

Suwanna Rongwiriyaphanich was born in Bangkok on December, 1977. She received her bachelor's degree in Architecture (B.Arch. – with honors) at Chulalongkorn University in Thailand. She started her academic carrier soon after her graduation as a lecturer in the Faculty of Architecture at Naresuan University – a public university in Thailand. A few years later, she was granted a scholarship from the German Academic Exchange Service (DAAD) to study for her Master Degree in master's degree in Infrastructure Planning (M.I.P.) from Stuttgart Universität in Germany. After graduation, she returned to Thailand and continues as a lecturer at Naresuan University. During the period of being a lecturer, she received opportunities to be involved in several research projects, as well as implementing various urban development projects. Based on her teaching, research and planning practice activities, she was promoted to an assistant professor in 2007.

In November 2008, she was granted a scholarship from the Royal Thai government to conduct a PhD research abroad. She decided on the Netherlands, because her interest relates to the topic of flood risk management. Under supervision of Prof. Vincent Nadin at the Chair of Spatial Planning and Strategy, Department of Urbanism, Faculty of Architecture and the Built Environment, Delft University of Technology, she received great support and opportunities for improving her academic and organisational skills in the international context. These include opportunities to participate in many PhD training courses and international conferences, being involved in teaching master's courses, organizing international conferences and conducting research projects independently. In 2014, Suwanna completed her PhD study and returned to Thailand again to continue her carrier at Naresuan University. Her recent research projects involve several fields of study and activities relating to public policy assessment, participatory planning, urban design, infrastructure planning, world heritage and urban conservation, and tourism-based development planning.