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### **Title: How to assess the adaptive capacity of legislation and policies**

Authors: Judith Klostermann (1), Joyeeta Gupta (2), Katrien Termeer (3), Sander Meijerink (4), Margo van den Brink (4), Sibout Nooteboom (6), Pieter Jong (5), Emmy Bergsma (2) and Robbert Biesbroek (1)

#### Abstract:

Intuitively it is clear that institutions can both enhance and hamper the adaptive capacity of a society. But what characteristics make an institution more or less helpful for development and implementation of adaptation strategies? Based on the literature, we developed an analytical framework to assess the adaptive capacity of institutions. The Adaptive Capacity Wheel consists of six dimensions: variety, learning, autonomous ability to change, leadership, legitimacy and resources. The six dimensions were operationalised into 22 criteria and were applied to formal institutions in a content analysis. We conclude that sometimes dimensions and criteria seem to contradict each other, which is not surprising, because this reflects existing paradoxes in the governance of society. We would like to discuss the analytical instrument and its possible uses with the audience of the Amsterdam Conference.

- 1) Wageningen University and Research Centre, Alterra, The Netherlands
- 2) VU University Amsterdam, IVM, The Netherlands
- 3) Wageningen University, SSG-PAP, The Netherlands
- 4) Radboud University Nijmegen, The Netherlands
- 5) Delft University, Netherlands
- 6) DHV, Amersfoort, The Netherlands

## 1. Introduction:

Adaptation to climate change is already taking place in many countries (Adger et al, 2007). An example is the production of snow in Alpine regions in Europe. In the Netherlands, a national adaptation strategy was published in 2008. The adaptation strategy envisions research into country-specific impacts of climate change, development of technological solutions and different choices for spatial planning. Adaptation also means ‘mainstreaming’ of adaptation ideas into existing policies, for example water management, land use, and disaster preparedness (Agrawala, 2005). Eventually adaptation will also lead to adaptation of the institutional framework: in a process of institutionalization climate change will lead to new or adapted rules.

The concept of ‘institution’ has an evasive character because virtually everything can be an institution. We have defined institutions as: sets of formal and informal rules, roles and norms that structurally and durably guide the behaviour of actors as well as interactions between actors (Gupta et al, 2009). Institutions are social structures that create the possibility of cooperation and coordination within and between social groups. Without institutions, solving public problems such as climate change would be impossible.

In ordinary language, the term ‘institution’ can also mean an organization or a law. Although organizations and laws are also installed and guided by institutions, they are not equivalent to institutions in this article.

Most of today’s institutions were constructed in a time when climate change was not yet recognized as a problem. Intuitively it is clear that these institutions can both enhance and hamper the adaptation strategies of a society. Which of the Dutch institutions can be expected to provide enough room for adaptation to climate change, and which ones should be changed? In short: *are the present Dutch institutions climate proof?* In this paper we will reflect on a method to answer this research question.

Paragraph 2 introduces the Adaptive Capacity Wheel. In paragraph 3 we explain how we approached the Wheel to the formal institutions. We selected documents in two steps and analysed their content with the Adaptive Capacity Wheel. In paragraph 4 we show two examples of such an analysis. In paragraph 5 the overall conclusions about the formal institutions are presented shortly. Paragraph 6 shows the results of a horizontal analysis: for each criterion, across all documents. Finally, in paragraph 7 we reflect on the method and the boundaries within which it can be used.

## 2. An assessment framework called the Adaptive Capacity Wheel

Based on the literature, we developed an analytical framework to assess the adaptive capacity of institutions, called the Adaptive Capacity Wheel (Gupta et al, 2009). The Adaptive Capacity Wheel shows the inherent capacity of an institution to respond to change. *Adaptive capacity* is the central concept in this framework. It is defined as

- The extent to which institutions enable actors to adapt to climate change;
- And the extent to which the institutions themselves can be changed by actors in order to adapt to climate change.

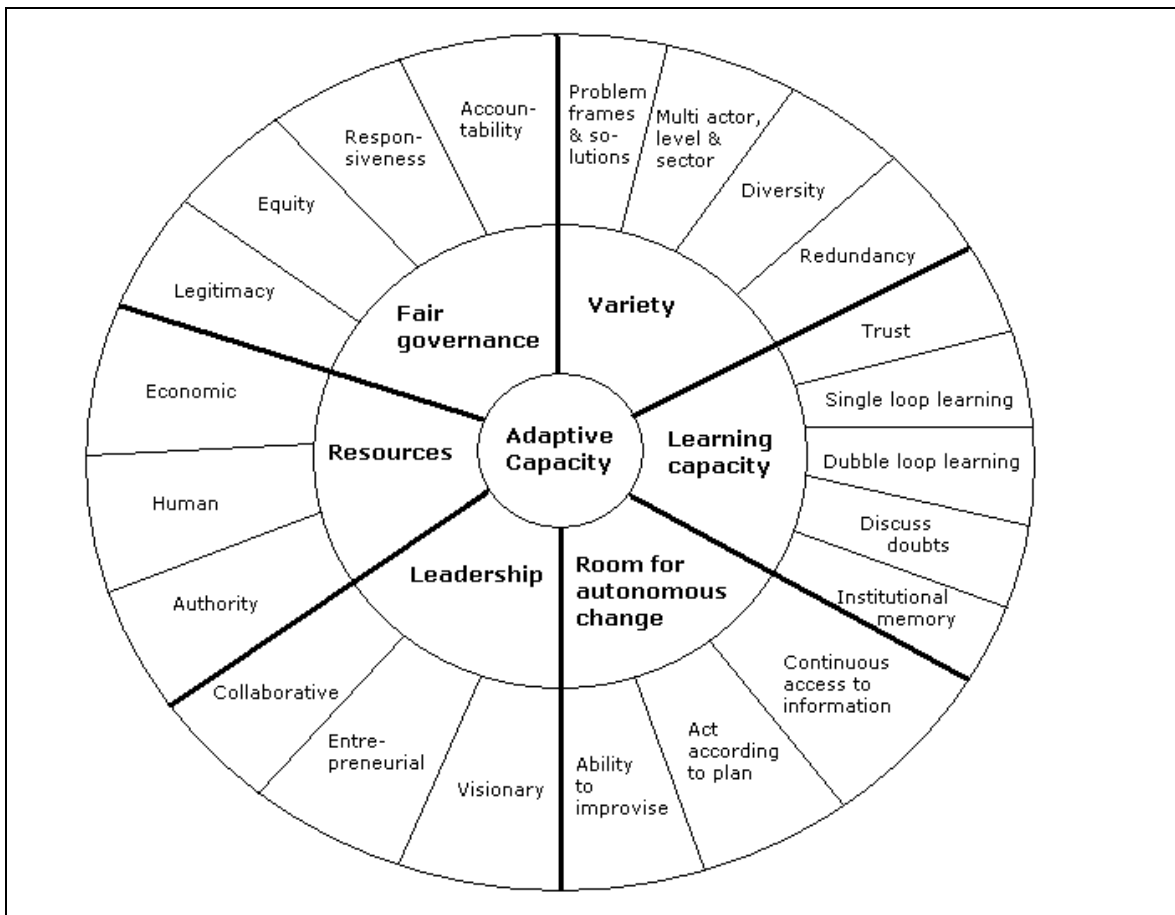
The Adaptive Capacity Wheel consists of six dimensions: variety, learning capacity, room for autonomous change, leadership, resources and fair governance. The first three dimensions are more specific for climate change:

- Variety is seen as an answer to the uncertainties inherent to climate change;
- Learning is considered necessary for continuous adaptation to change;
- Room for autonomous change is related to the extreme climate events that may occur.

The latter three dimensions apply to policy in general: with leadership, resources and fair governance policies are more likely to be effective, and this is also considered to be true for climate policy.

The six dimensions were developed further into a total of 22 criteria. An overview is given in figure 1. A more elaborate description of the Adaptive Capacity Wheel, the six dimensions and 22 criteria is given both in working document 2 of project IC12 (Gupta et al, 2008) and in a paper submitted to Climate Policy (Gupta et al, 2009). The six dimensions and 22 criteria were applied to formal and informal institutions in a content analysis and in four case studies. This paper reports on the analysis of formal institutions.

Figure 1: the Adaptive Capacity Wheel



### 3. Method for the content analysis

The purpose of the Adaptive Capacity Wheel is to examine an institution in terms of its strengths and weaknesses and opportunities for improvement. The first step we had to make is to decide what institutions we would apply it to, and how. What should we actually consider as a formal institution? A law? A policy document? A document is not an institution, but a text that can become institutionalised in daily practices. We decided to make an overview of all possible documents that could be relevant for our analysis.

An overview was made of all relevant documents concerning climate adaptation in the Netherlands in general and concerning the four sectors of agriculture, nature, water and spatial planning. These four sectors are most strongly related to land use, and land use is expected to be affected most by climate change. In a background document 93 documents were summarized. One of the questions we asked was if such a document took climate change into account.

From this overview it appeared that, after 2001, laws and policy documents often include climate change, and before 2001, they often do not. In this sense, the institutions designed for climate policy and for water policy are often ahead of other institutions. We also concluded that the laws and policy documents within one sector build on each other. In each sector, a different paradigm seems at work, shared by politicians, civil servants, scientific experts, NGO professionals and volunteers in that sector.

Table 1: documents selected for applying the Adaptive Capacity Wheel

International	UNFCCC, 1992; Kyoto Protocol 1997 Convention on Biological Diversity EU Framework Directive on Water EU Directive on Flood Risks Common Agriculture Policy (CAP) Natura 2000 and the Birds and Habitats Directives EU Whitepaper on adaptation
National	National Adaptation Strategy: make space for climate! Strategy National Safety and National Risk Assessment
Agriculture	Agenda for a Living Countryside - Multi-year programme 2007-2013 Law on Land Use in Rural Areas New agrarian insurances
Nature	Ecological main structure Law for the Protection of Nature Flora and Fauna Law
Water	National Agreement on Water National Water Plan 2008 Policy Guideline Large Rivers Water Act Water Test
Spatial Planning	National Spatial Strategy Spatial Planning Act Strategic Environmental Assessment

Because it was not possible to apply the Adaptive Capacity Wheel to all 93 documents, we chose 23 documents or sets of documents. Table 1 shows the result of this selection. For the selection we used the following criteria:

- Documents with an overarching character;
- Influential documents (other documents refer to it often);
- The most recent document (including innovative views);
- Between 3 and 5 for each of the involved sectors.

The next step was to apply the Adaptive Capacity Wheel to the 23 documents. Assessing adaptive capacity with this framework involves normative judgments on whether the researcher thinks a criterion is met or not. Every person that uses the framework may come to a slightly different judgement, because his or her norms and views will differ from the next person. We adjusted somewhat for subjectivity by doing the assessment in three rounds: a first scoring effort by one researcher, then a second round by a researcher of the team that was an expert in a specific sector, and then a third round in which the final scores were discussed in a team of three researchers involved in the content analysis. We also had a validation round with the IC12 advisory group, but this was on the general level of a sector and not criterion by criterion.

If we find an item in a law or policy document that, in our view, contributes to a criterion, this leads to a score. For example, if a law prescribes four-yearly evaluations, this will lead to a positive score on the dimension ‘learning capacity’. We did not give a limitative list of elements that lead to a score, because human ingenuity will forever come up with new, innovative institutional items that can enhance adaptive capacity. To give a limitative list would be against the idea of adaptive capacity.

We used a scale of six categories to judge the policy documents on the different criteria. The six-category scale helps to create a structured approach for evaluation of the different policy documents. The six scores and their explanation are shown in table 2. The idea of the colour-code is that it does (orange / red) or does not (green) draw attention to a criterion.

Table 2 The colour-scheme of the Adaptive Capacity wheel

green	lime	light yellow	light orange	red	white
Institutional structure enhances adaptive capacity for adaptation	The structure exists, and could but is not (yet fully) applied to adaptation	Neutral score (positive nor negative effect expected)	Gap that needs to be filled to counteract negative effect on adaptive capacity	Institutional structure obstructs adaptive capacity for adaptation	Unknown (no information available to apply a score)
Score 2	Score 1	Score 0	Score -1	Score -2	No score

The reason for using a numerical scale lies in the foundation it provides for the aggregated analysis per dimension and per document. Numerical scores and aggregation also have drawbacks. We are making subjective judgments, and with the numbers we

may suggest more accuracy than we can provide. Also, the criteria and dimensions are different factors that cannot be summed up. We also have strong suspicions that several criteria are contradictory to others, and that some criteria may be more important than others. However, we have no data about these contradictory forces or possible weights of criteria. Therefore, we treat each criterion the same. Another problem is that the dimensions do not have the same number of criteria; the dimensions that have more criteria automatically gain more weight in the assessment. Again, we missed the arguments to delete or merge criteria.

As mentioned before we cannot avoid subjective judgements. Therefore, next to ‘scoring’ with a number and a colour, we added a column to explain why we scored the element in such a way. Even if this assessment is qualitative in nature, it makes our reasoning more transparent.

For aggregated scores we also have to decide what count gets what colour (see table 3). The reasoning used for the total score per criterion is that between 1 and 3 it is considered slightly positive (lime) and 4 points or higher is positive (green). For the total, only a score of exactly 0 is light yellow. The reasoning behind this is to work more or less with averages; and to rule out the effect of having more than 3 criteria for some of the dimensions.

For the overall score per document, a score of 5 or lower is light yellow, because less than 6 points overall is considered too weak even for a slightly positive score. An overall score above 18 is outright positive (green). The reasoning behind this way of aggregating is that when on average 3 criteria per dimension are slightly positive (6x3), this opens a lot of possibilities that the institution will be adaptive; in such a case there are enough openings that people can use, even if it is not perfect.

Table 3 Explanation of aggregated scores

<i>Total per dimension</i>	<i>Overall per document</i>
4 or more	18 to 42
1 to 3	6 to 17
0	-5 to 5
-1 to -3	-6 to -17
-4 or less	-18 to -42

#### 4. A law and an agreement as examples of results for a document

The first example is the table for the ‘Law for the Protection of Nature’. The first Dutch law for nature protection dates from 1967. This law was designed to protect nature areas and endangered species. Because of international treaties (e.g. Ramsar) and European directives (e.g. Birds and Habitats directives), a new Law for the Protection of Nature was written, and adopted in 1998. This law is only for protection of nature areas, including Natura-2000 areas. The protection of species is dealt with in a separate Flora and fauna law.

In table 4 the application of the Adaptive Capacity Wheel to the Law for the Protection of Nature is shown. The first two columns represent the dimensions and criteria of the Wheel. The third column contains the scores and the fourth column shows the arguments that led to the score. Colours are used based on tables 2 and 3. The result draws our attention, firstly, to the dimension of variety. The table says that there is only a small number of problem frames involved in the law, and that the law does not aim for abundance (redundancy) of nature but for saving the little that is left. The dimension of leadership also is red, because the law has low scores on leadership. On learning, however, the scores are rather high. In the overall score, the colour for this law is light yellow. In this overall score, all detail is lost.

Table 4: Application of the Adaptive Capacity Wheel to the Law for the Protection of Nature (Natuurbeschermingswet)

<i>Dimension</i>	<i>Criteria</i>	<i>Score</i>	<i>Explanation</i>
Variety	Variety of problem frames and solutions	-2	Framing of the problem is limited to the experts from the nature sector working at different organizations
	Multi-actor, level and sector approach	1	All levels and sectors that are planning activities in nature have to deal with this law. Everyone is informed in the phase of the implementation plan.
	Room for diversity	2	Biodiversity is the goal of the law; nature parks are also diverse. The rule of compensation is unspecific so leaves room for diversity.
	Redundancy	-2	Nature's resources are limited and declining; the goal is to save what can be saved and nothing more
	Total	-1	
Learning Capacity	Trust	-1	Nothing is allowed in nature parks, and if someone wants to do something he/she has to prove first that it has no damaging effect
	Single loop learning	2	There are several mechanisms for learning: the Nature policy plans can be adjusted; progress of policy and status of nature are regularly reported, and the 'appropriate assessment' can also be a source of learning.
	Double loop learning	-2	Goals are fixed and not open for discussion.
	Discuss doubts	2	There is room to discuss doubts even up to the Council of State.
	Institutional memory	2	The regular reporting activities and the underlying monitoring represents a large institutional memory
	Total	3	
Room for autonomous change	Continuous access to information	1	There is considerable information available and is probably accessible??
	Act according to plan	1	There is a detailed planning cycle in the law. For every nature territory there will be a plan; if plans are feasible is not assessed beforehand
	Capacity to improvise	-2	No room at all for autonomous improvisation or innovation
	Total	0	
Leadership	Visionary	-2	It is a reactive instrument to safeguard nature rights and

	leadership		to implement EU regulation
	Entrepreneurial leadership	-2	The legal and bureaucratic approach stifles all entrepreneurship
	Collaborative leadership	-2	In the first phase of deciding on the goals, only a limited number of actors is involved, in the implementation phase many actors are involved.
	Total	-6	
Resources	Authority	1	It is formally approved at the national level and supported at the EU level; the ministry of LNV has a lot of power according to the law.
	Human resources	1	Some human resources are reserved for producing the national update reports
	Economic resources	0	Costs have to be covered by landowners and provincial government
	Total	2	
Fair Governance	Legitimacy	2	It is formally approved at the national level and based on EU directives
	Equity	0	Equity is not an issue
	Responsiveness	-2	The top down decision making process leaves little opportunity to amend.
	Accountability	-1	Accountability is only arranged in regular reporting as well as policy implementation
	Total	-1	
Overall		-3	

The second example is the National Agreement on Water (Nationaal Bestuursakkoord Water). In 2003, the National Agreement on Water was signed by the Dutch state, the associations of the provincial and municipal governments and the association of the water boards. With this agreement the governments laid down how they were going to address the water problems of the 21<sup>st</sup> century in a collective way. Goals of the agreement are to guarantee water safety from 2015 onwards, anticipating on climate change, sea level rise, and soil subsidence.

In table 4 the application of the Adaptive Capacity Wheel to the National Agreement on Water is shown. The scores for this document are reassuring: no reds, only some weaknesses signalled for variety of problem frames. The scores for learning are high, and so are the scores for resources. It leads to an overall score of 23 which is coloured green.

Table 5: Application of the ACW to the National Agreement on Water

<i>Dimension</i>	<i>Criteria</i>	<i>Score</i>	<i>Explanation</i>
Variety	Variety of problem frames and solutions	-1	The main problem frame is that of water safety. The document seems to be made to create one shared problem frame, not to create room for more problem frames
	Multi-actor, level and sector approach	1	Certainly multi-level (although water boards and municipalities are only represented by their associations); also linkages with other sectors; mostly government and little influence of citizens and private sector
	Room for diversity	1	A diversity of policy instruments related to water is addressed



	Redundancy	2	The NBW encourages redundancy as uncertainty about the climate is a reason to take more robust measures - better safe than sorry
	Total	3	
Learning Capacity	Trust	1	The document builds on the trust between parties
	Single loop learning	2	There is a knowledge platform and innovation programmes have been started. Every 4 years the agreement is evaluated.
	Double loop learning	1	New climate scenarios are taken into account allowing for challenging the assumptions
	Discuss doubts	0	There is no explicit mechanism to discuss doubts
	Institutional memory	2	Monitoring and evaluation is well developed: results are monitored and evaluated on a structural basis.
	Total	6	
Room for autonomous change	Continuous access to information	1	A public campaign with general information is continued
	Act according to plan	1	It is an explicit plan with tasks divided between parties; evaluation shows that most aspects have been realized and the all should be achieved by 2015. Moreover, the National Agreement on Water, and the National Agreement on the Water Chain are sometimes incompatible.
	Capacity to improvise	2	Innovation programmes have been started / continued
	Total	4	
Leadership	Visionary leadership	1	The document provides a comprehensive vision for the medium term although it does not change the existing paradigm; it allows for visionary leadership
	Entrepreneurial leadership	1	Oriented to acting: specifies tasks for actors; mostly governmental however and not so much the private sector
	Collaborative leadership	2	Collaboration is the main goal of the document
	Total	4	
Resources	Authority	2	Most important governments are involved; municipalities and water boards are indirectly involved via their collective organizations; not legally binding
	Human resources	2	Many people are working on realization of this agreement
	Economic resources	1	Mostly regular budgets but some extra 'synergy budget' is made available by the state level
	Total	5	
Fair Governance	Legitimacy	1	Approved by all governments; not legally binding
	Equity	0	There are no provisions on equity in this document
	Responsiveness	0	Not much interaction outside of the governments: only an information campaign and a short reaction period on spatial plans.
	Accountability	0	Results are monitored and evaluated on a structural basis; however, the parties cannot be held accountable.
	Total	1	

Overall		23	
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## 5. Aggregated scores and interpretation for each sector

Although the overall scores lead to loss of detail, and even though some criteria may not add up but counteract each other, we did use aggregated scores to be able to compare sectors. In table 6 the international and national documents are divided over the sectors.

The general picture coming out of this assessment is that the institutions in the areas of climate policy and water policy seem to enhance adaptive capacity the most. Apparently, incorporating ideas about climate change has already led to alterations in these institutions towards more adaptive capacity. The highest score in the two categories is 28, and the others are between 18 and 23 points. We have to take into account that the highest possible score is 42. This means that even in the green cases, it is likely that changes are possible to increase adaptive capacity.

Table 6: Aggregated scores for all 23 documents

Climate /general	UNFCCC, 1992; Kyoto Protocol 1997	22
	EU Whitepaper on adaptation	23
	National Adaptation Strategy: make space for climate!	19
	Strategy National Safety and National Risk Assessment	13
Nature	Convention on Biological Diversity	20
	Natura 2000 and the Birds and Habitats Directives	-11
	Ecological main structure	1
	Law for the Protection of Nature	-3
	Flora and Fauna Law	-10
Water	EU Framework Directive on Water	19
	EU Directive on Flood Risks	22
	National Agreement on Water	23
	National Water Plan 2008	28
	Policy Guideline Large Rivers	18
	Water Act	22
	Water Test	12
Agriculture	Common Agriculture Policy (CAP)	7
	Agenda for a Living Countryside - Multi-year programme 2007-2013	21
	Law on Land Use in Rural Areas	25
	New agrarian insurances	13
Spatial planning	National Spatial Strategy	16
	Spatial Planning Act	17
	Strategic Environmental Assessment	16

The sectors agriculture and spatial planning have relatively good scores, especially when we consider that integration of ideas on climate change has not yet taken place in the institutions of these sectors. The reason for the moderately high score is that the institutions for agriculture and spatial planning often have an enabling character: they open up space for development and innovation. Therefore, these institutions also open up possibilities for adaptation to climate change. In these sectors there also is a lot that can be improved to enhance adaptive capacity.

The sector showing the lowest scores is nature. In this sector institutions often have a limiting character. The two main problems in this sector are that a) conservation is the main goal, and this is inherently contradictory to adaptation; and b) the decision making procedures in this sector are dominated by ecological experts. The inherent contradiction between nature conservation and adaptation is not necessarily a failure of the institutions: it just shows that climate change is a problem for nature, and can inspire to work harder on mitigation of climate change. Opening the debate on the design of nature institutions to more stakeholders should be possible, since it already has been done for the Convention on Biological Diversity.

## **6 Results of the evaluation for each criterion**

In the previous paragraphs we described how the Adaptive Capacity Wheel was applied to each document. In that exercise we used the criteria as an inspiration to look for items in a policy document or a law that would qualify for an improvement of adaptive capacity. These items were summed up in the last column as arguments for a certain score (see tables 4 and 5). From these arguments we could also learn something: what kind of institutional structures have been invented and used in the Netherlands so far, that already seem helpful for enhancing adaptive capacity?

Therefore, after the so-called vertical analysis, we did a horizontal analysis: we looked through all the arguments for each of the criteria for each of the scores. The results were collected in tables for each criterion. Two examples are given below: Table 7 for the criterion *variety of problem frames*, and Table 8 for the criterion *financial resources*. The interesting thing about these tables is that they provide an overview of possibilities (and negative examples) across the five different areas of policy making that were part of this research. In other words, the tables can be used for cross-sector learning.

While making these tables, we also ran into inconsistent choices that were made while we were doing the vertical analysis. Especially the choice between 1 and 2, or between -1 or -2, proved to be difficult. The horizontal analysis helped in making the scores more consistent and was used to fine-tune the Adaptive Capacity Wheel.

Table 7 shows that we found more items on the positive side than on the negative side for the criterion *variety of problem frames*. Apparently, many ways have been found already to incorporate more than one problem frame into the Dutch institutions: using general goals instead of specific ones, thereby leaving room to area-specific interpretation;

diversity as an explicit goal; explicitly linking sectors to mix different social groups in a policy process. On the negative side we see items like: very detailed prescriptions; policy making by a closed group of actors; and the promotion of a single world view.

Table 7: Arguments that lead to a score for the criterion *variety of problem frames*

2	1	0	-1	-2
<ul style="list-style-type: none"> <li>• Only a general goal; no explicit solutions prescribed</li> <li>• Policy of region-specific implementation</li> <li>• Striving for diversity e.g. diversified economy and multifunctional landscapes</li> <li>• Process-oriented law that allows for exchange of different problem frames</li> <li>• Introduces a new paradigm e.g. development-oriented spatial planning or integrated water management</li> <li>• Legal basis to link between legal sectors e.g. water act and spatial planning act</li> </ul>	<ul style="list-style-type: none"> <li>• Use of holistic concepts such as integral ecosystems, without explicitly aiming at adaptation.</li> <li>• Introduction of a new institutional arrangement such as new agrarian insurances allows for many problem frames;</li> <li>• Demand to incorporate at least three perspectives</li> <li>• Incorporate a concept alien to the sector e.g. water manager has to anticipate on spatial-economic development</li> <li>• Build in process in which two sectors meet</li> <li>• Use term 'tailor-made solutions'</li> </ul>	<ul style="list-style-type: none"> <li>• Builds on the notion of scientific facts e.g. IPCC related consensus and not on the notion of different problem frames.</li> <li>• Mostly oriented towards convincing others of climate change, not excluding other views but not encouraging them either</li> </ul>	<ul style="list-style-type: none"> <li>• Limited, sectoral aim e.g. enhance farmer income.</li> <li>• Limited by global agreement e.g. GATT</li> <li>• Debate to create one shared problem frame, not to create room for more problem frames</li> </ul>	<ul style="list-style-type: none"> <li>• Little space for multiple problem frames</li> <li>• Very specific in its aims e.g. which species should be protected at what location.</li> <li>• Problem frame defined by a relatively small group of experts</li> <li>• Processes of structural change such as climate change are not taken into account</li> </ul>

In table 8 we also see an emphasis on positive items, but slightly more for score 1 than for score 2. Apparently, Dutch institutions usually make some funds available, but not in an abundant way, always striving for cautious and efficient use of resources. Most positive for adaptive capacity is a clear and sufficient budget for implementation; and negative, obviously, is if new goals are set without any new funding.

Table 8: Arguments that lead to a score for the criterion *financial resources*

2	1	0	-1	-2
<ul style="list-style-type: none"> <li>• Sufficient resources</li> <li>• Significant budget for implementation (even though it may not be enough to achieve all goals)</li> <li>• Clear which resources are available</li> <li>• Law improves financial arrangements: distribution rules</li> </ul>	<ul style="list-style-type: none"> <li>• Resources available, but contested.</li> <li>• Has a financial mechanism but unclear if available</li> <li>• If funds reflect this priority still has to be ensured.</li> <li>• Some financial resources available but clearly not enough</li> <li>• Mostly regular budgets but some extra 'synergy budget'</li> </ul>	<ul style="list-style-type: none"> <li>• Several funds available but not labelled</li> <li>• No explicit funding apart from research budgets</li> <li>• Financial mechanism exists, little money in this fund</li> <li>• Costs have to be covered at lowest (administrative) levels</li> </ul>	<ul style="list-style-type: none"> <li>• No extra budget for achieving new aims</li> <li>• Low margin in sector</li> <li>• Lack of funds</li> <li>• Implementation negative for economic value of land</li> <li>• Decentralization not accompanied with budget transfer</li> </ul>	<ul style="list-style-type: none"> <li>• No funding organized in the law</li> <li>• Leads to extra costs at lowest level of implementation</li> </ul>

## 7. Discussion: what is the value of the Adaptive Capacity Wheel?

In this paragraph we will not draw any conclusions concerning the climate-proofness of the Dutch institutional framework, as we only presented some examples of the results. The purpose of this paper is to reflect on the functioning of the assessment framework that we called the 'Adaptive Capacity Wheel'.

The advantages of the framework are:

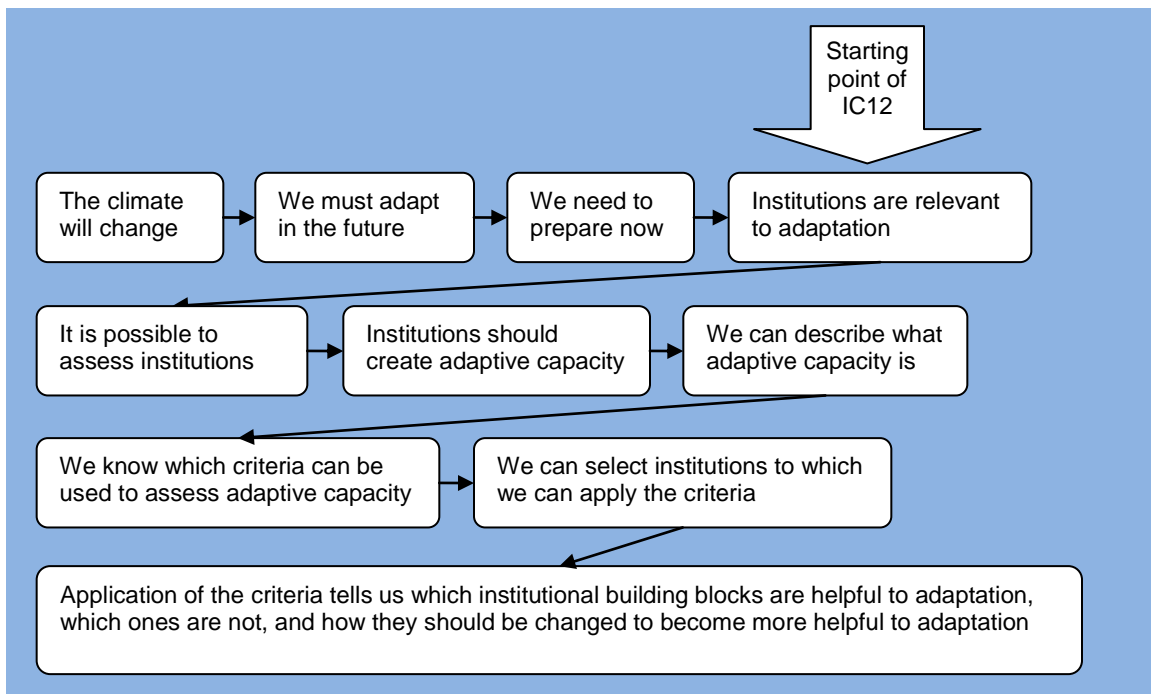
- It is a first effort to provide a comprehensive (but not limitative) list of criteria for assessing adaptive capacity provided by institutions;
- Applying the criteria in a systematic way shows which sectors need attention, and in which respects a specific policy or law can be improved to enhance adaptive capacity;
- It can be used as a tool for learning between sectors on how institutions can be built in order to provide more adaptive capacity;
- It provides some first hints in which respect Dutch institutions seem to be developed well (e.g. learning) and in which respects there seems to be a gap in Dutch institutions (e.g. authority).

The framework also has some significant weaknesses, because none of the conclusions we get from applying the Wheel is based on 'hard' measurement. To put this more

strongly: there is no proof that a maximum score on each of the 22 criteria will lead to better adaptation to climate change. One reason for this is the fact that we built the assessment framework on a large number of assumptions.

In this research project we had several years to work on a big question for society: *are the Dutch institutions climate-proof?* We used scientific insights and a systematic method to address this question. We also made our choices as transparent as we could. Still, to be able to answer such a big question, there was no other choice than to work with many assumptions, to be able to arrive at an overall answer. In figure 2 we show the most important assumptions that underlie the Adaptive Capacity Wheel. Several assumptions were made even before the research started: that we need to adapt to climate change, that it is useful to start adapting now. The most crucial assumptions made within the research project are that institutions can enhance adaptive capacity, and that our 22 criteria are able to capture the most relevant aspects of adaptive institutions. One assumption we have doubts about is the choice to aggregate scores, because there are tensions between criteria, and we have little information about the mechanisms that may link them up. For the same reason, we have not been able to attach weights to the criteria.

Figure 2: Assumptions made to arrive at conclusions drawn on the basis of application of the Adaptive Capacity Wheel.



Several of our assumptions may be wrong. It is, for example, possible that it is advisable to people who want to adapt to climate change to ignore institutions for a while, because adaption to climate change is easiest in an institutional void –a situation where institutions are absent. It is also possible that institutions will follow adaptation automatically, and that there is no need to assess adaptive capacity beforehand. Or maybe institutions do matter for adaptation, but part of, or all of, our criteria are inaccurate. The

Adaptive Capacity Wheel does not provide any proof to underpin our assumptions. The Wheel should, therefore, only be used as a tool to facilitate discussions on existing institutions in relation to climate adaptation.

In our view, the way forward is:

- Careful application of the Adaptive Capacity Wheel within its limits: a low score does not mean that something is wrong, instead it means that a second look and a debate is needed about a policy or a law.
- New empirical research to investigate if the assumptions in this research are correctly made; for example: do policies and laws with a high score indeed lead to more adaptive activity? Or does more adaptive activity lead to different institutions?

Finally, we are pretty sure about this: it is *not* enough if institutions provide adaptive capacity. We can only be guaranteed of climate-proofness if people in general are trying to invent, use and evaluate adaptive strategies, and if the opportunities that institutions provide are actually used to this end.

We would like to discuss the analytical instrument and its possible application with the audience of the Amsterdam Conference.

## References

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