SYMPOSIUM

institutions for adaptation to climate change: comparing national adaptation strategies in europe

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Abstract

In addition to reducing greenhouse gas emissions, societies worldwide have to cope with the potential impacts of climate change. The central question of this paper is to what extent our historically grown institutions enable actors to cope with the new challenges of climate adaptation. We present six qualities of governance institutions that are crucial to allow for, and encourage adaptation, and apply them to the National Adaptation Strategies of the Netherlands, the United Kingdom, Finland and Sweden. We conclude that although the governance institutions involved seem to have the basic qualities required, they face five institutional weaknesses, causing tensions on the long term: (1) lack of openness towards learning and variety; (2) strong one-sided reliance on scientific experts; (3) tension between top-down policy development and bottom-up implementation; (4) distrust in the problem-solving capacity of civil society; and (5) wickedness of reserving funding for long-term action.

Keywords institutions; climate change; adaptive capacity; National Adaptation Strategies; European Union

In addition to efforts to reduce greenhouse gas emissions, many countries face the challenge to cope with the projected impacts of climate change, such as rising sea levels, changing hydrological patterns and extreme weather events (e.g., IPCC, 2007).[1] Climate change adaptation focuses on anticipating the projected impacts of climate change in terms of moderating potential damages, taking advantages of opportunities or coping with the

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consequences (EEA, 2008). Adaptation can be reactive or anticipatory, individual or collective, private or public, planned or autonomous (Adger *et al*, 2005). Possible adaptation measures range from the construction of climate-proof dikes, the adjustment of agricultural practices, the development of evacuation plans, to the exploiting of new tourism opportunities. In addition, many western countries have begun to develop policies and comprehensive National Adaptation Strategies to stimulate and coordinate these developments (Biesbroek *et al*, 2010).

However, developing and implementing these policies and measures is not easy due to all kinds of complexities. Decisions have to be taken about measures that anticipate inherent, uncertain and unpredictable developments. These uncertainties concern the magnitude of climate change, the impacts of climate change and the effectiveness and feasibility of various policy options. Many public and private actors are involved, each having different norms, interests and power resources. Ambiguity arises because underlying problems and proposed adaptation measures are valued, interpreted and framed differently by these different actors (Dewulf *et al*, 2005). Because of the many uncertainties and ambiguities surrounding climate change issues, governance actors not only face the challenge to develop and realise planned adaptation strategies, but also to increase the adaptive capacity of society through their policies (Jordan *et al*, 2010).

Climate change adaptation involves policies developed in a wide variety of policy fields, such as housing, land-use planning, agriculture, health, energy and water management. These policies are embedded within their own specific governance institutions. These governance institutions are the product of times in which the climate issue was hardly of any importance. This paper deals with the question, to what extent these historically grown institutions can enable society to cope with the new challenges of climate adaptation. Or to put it more precisely: do our governance institutions allow and encourage actors to develop and realise adaptation strategies and enhance the capacity of society to adapt to climate change?

'... governance institutions are the product of times in which the climate issue was hardly of any importance'.

In what follows, we first present an analytical framework that can be used to assess the capacity of institutions to enable climate change adaptation. It identifies six central qualities of governance institutions. Subsequently, with the help of this analytical framework we assess the National Adaptation Strategies of the Netherlands, the United Kingdom, Finland and Sweden, respectively. We end this paper with several conclusions on the capacity of the governance institutions involved to adapt to the projected impacts of climate change.

ANALYTICAL FRAMEWORK

Inspired by Scott (2008), we define institutions as cognitive, normative and regulative structures that provide stability and meaning to social behaviour. These structures can consist of formal and informal rules and roles. They guide, to a considerable extent, the actions and interactions of actors, but are also shaped and reshaped by these actors. Institutions thus both enable and constrain the opportunities for actors to

respond to changes in their environment (Giddens, 1984; Scharpf, 1997). Governance institutions are those institutions concerned with policy making and policy implementation.

On the basis of an extensive study of the literature about institutions, governance, high-reliability organisations and climate change adaptation, we have identified six qualities of institutions that are crucial to enable climate change adaptation (for an extensive overview and theoretical underpinning of our analytical framework see Gupta *et al*, 2010); three core qualities, namely, variety, learning and room for autonomous change; and three supporting qualities, namely, leadership, resources and fair governance.

'... we have identified six qualities of institutions that are crucial to enable climate change adaptation ...'

'... important that the actors involved are able and willing to scrutinise their underlying paradigms and assumptions ...'

VARIETY

Because we simply do not know enough to develop an optimal and fixed climate adaptation strategy for the next decades, it is often argued that, perhaps, a better strategy to deal with the manifold uncertainties and ambiguities is to allow for, and encourage, variety (Verweij and Thompson, 2006; Pahl-Wostl *et al*, 2007; Weick and Sutcliffe, 2001). In a similar vein, according to the 'law of requisite variety', the variety within a system must be at least as great as the environmental variety against which it is attempting to adjust itself (Conant and Ashby, 1970). The variety quality challenges mainstream policy approaches that focus on clarity, rationality, reductionism and performance-oriented management (Pollit and Bouckaert, 2000). The extent to which institutions allow for, and encourage, variety is indicated by the involvement of a variety of policy frames; the involvement of a variety of actors during policy formulation and implementation processes; and the room to promote a differentiation of policy options as well as to develop tailor-made solutions.

LEARNING

Owing to the uncertainties about how to anticipate climate effects, it is often argued that adaptation should be considered a learning process (Pahl-Wostl *et al*, 2007; Dewulf *et al*, 2005). Ideally, societal actors exchange their problem frames and together make sense of the issues at stake, while at the same time discussing doubts (Weick and Sutcliffe, 2001). As climate change adaptation is a relatively new phenomenon, it is likely that strategies will conflict with dominant values, routines and problem perceptions and solutions. It is therefore important that the actors involved are able and willing to scrutinise their underlying paradigms and assumptions, and engage in single, double and perhaps even triple loop learning (Argyris and Schön, 1978). The extent to which institutions allow for, and encourage, learning is indicated by the possibility and willingness to learn from each other across boundaries; single and double loop learning; and a focus on listening and discussing doubts rather than defending views.

ROOM FOR AUTONOMOUS CHANGE

The third quality concerns the room that actors have to adjust their behaviour to changing circumstances. In this context, a distinction can be made between autonomous and planned changes. Whereas autonomous changes refer to the everyday responses to everyday contingencies, breakdowns, exceptions, opportunities and unintended consequences (Orlikowski, 1996), planned changes are about anticipating the future and about making plans to deal with potential future threats. Paradoxically, planned state intervention can damage structures and practices of autonomous change (Scott, 1998). The extent to which institutions allow for and encourage autonomous change is indicated by a continuous monitoring and interpretation of potential climate change impacts; a culture in which improvising is not only allowed but also valued; the capacity of self-organisation by the actors involved; and a government system in which the central authorities are not solely responsible for the issue of climate adaptation and the potential climate risks.

LEADERSHIP

We have distinguished three types of leadership that are crucial for promoting and realising adaptation strategies. First, visionary or directional leaders are good at linking time scales, and they are able to convince others of the need for anticipating potential future threats (Young, 1991). Second, entrepreneurial leaders are good at gaining access to the necessary resources for realising projects (Andersson and Mol, 2002; Termeer, 2009). Third and finally, collaborative leaders are good at bridging and building coalitions (Huxham and Vangen, 2005). To successfully adapt to the potential effects of climate change, all three types of leadership are required. Institutions should thus allow for and encourage visionary leadership, entrepreneurial leadership and collaborative leadership.

RESOURCES

For adaptation efforts to succeed, society needs to be able to generate sufficient resources (Biermann, 2007). Financial resources are required to develop, experiment with and realise adaptation strategies. Educated and qualified people, that is, human resources, and authority are required to take and implement decisions. To enable climate change adaptation, institutions should thus allow for and encourage the generation of financial resources, human resources and authority.

FAIR GOVERNANCE

Finally, it is important that institutions meet fair governance criteria. As we emphasise redundancy over cost-effectiveness, we prefer the term 'fair governance' rather than the dominant phrase of 'good governance' (e.g., Botchway, 2001). Institutions should allow for and encourage legitimate policy processes, protect basic rights and equity, and be responsive, transparent and accountable.

FOUR EUROPEAN COUNTRIES AND THEIR NATIONAL ADAPTATION STRATEGIES

All over the world various countries have started to develop National Adaptation Strategies (Biesbroek *et al*, 2010). A National Adaptation Strategy is a long-term vision or general plan of action for addressing the impacts of climate change, and often includes a mix of policies and measures with the overarching objective of reducing the country's vulnerability (Swart *et al*, 2009; Burton *et al*, 2005). The aim of a National Adaptation Strategy varies from setting the political agenda, to an umbrella type

of document to coordinate all governmental action on climate change adaptation. For our assessment of governance institutions, we have selected four European countries that have taken distinctive approaches in developing National Adaptation Strategies, namely, the Netherlands, the United Kingdom, Finland and Sweden (see also for more detailed information Swart *et al*, 2009).

THE NETHERLANDS

As a country with over 50 per cent of its gross added value below sea level, the Netherlands is very vulnerable to the impacts of climate change, particularly through the water dimension (Veraart and Bakker, 2009). Several extreme events in the period 2003–2005 resulted in the start of the Adaptation Space and Climate Programme – an inter-ministerial team supported by several research programmes and chaired by the Ministry of Housing, Spatial Planning and the Environment. The first step was the development of a National Adaptation Strategy to make spatial planning 'climate proof', which was signed by all relevant ministries by the end of 2007. One of the next steps will be to develop plans in which local and regional responsibilities are described in more detail. Noteworthy are the parallel developments within the Ministry of Transport, Public Works and Water management. It enhanced the installation of a 'heavy' Delta Commission, which was commissioned to develop an integral perspective to make the Netherlands climate proof, particularly for water-related issues. Their ambitious advice, published in September 2008, is not directly related to the National Adaptation Strategy. Whereas the implementation of the National Adaptation Strategy is lagging behind, the political impact of the commission's advice is very high. The recommendations are now effectuated through the Delta Programme.

THE UNITED KINGDOM

Because the UK is particularly vulnerable to ecosystem change, drought, sea-level rise and (urban) flooding (DEFRA, 2009), there have been many ongoing activities well before the turn of the century. Most renown is, perhaps, the UK Climate Impacts Programme that facilitates climate change impacts and vulnerability information, and supports municipalities and regions to adapt to the projected impacts – as well as raise awareness about the need to adapt. Moreover, the UK was the first country to include climate change adaptation as a part of national law, by developing a statutory framework in which governments are obliged to develop risk and impact assessment and develop appropriate adaptation programmes. This Climate Change Act (enacted November 2008) was thereby giving guidance to local and regional adaptation strategies. One of the direct results of the Act was the development of the governmental 'Adaptation to Climate Change' programme (2008–2011), which plays a prominent role in impact assessments, awareness raising and the development of climate change adaptation indicators. Furthermore, addressing climate change is devolved to each individual country. For instance, the English Department for Environment, Food and Rural Affairs published its National Adaptation Strategy in 2008. In contrast to many other adaptation strategies, it reflects on the current activities and provides examples of good-practice and gives guidance for the administrative needs to implement adaptation strategies effectively.

FINLAND

Although there are considerable benefits for Nordic countries in agriculture and forestry, Finland has several vulnerable sectors such as water management,

tourism and reindeer husbandry, where the impacts are likely to outweigh the benefits of climate change. Finland has been the first country in the world to develop a comprehensive National Adaptation Strategy. In 2005 an inter-ministerial working group – including two research institutes – chaired by the Ministry of Agriculture and Forestry published a National Adaptation Strategy (Carter, 2007). It provides a comprehensive overview of the different IPCC emission scenarios, associated socio-economic scenarios and potential impacts for different sectors. It also presents a list of potential anticipatory and reactive adaptation measures to cope with climate change, and mentions that if the scientific understanding of climate change impacts change, the type of measure and strategies also will change. To implement the strategy, each ministry was asked to develop more detailed and operational adaptation plans per sector – for example, infrastructure, forestry, tourism, etc. In June 2009, a mid-term committee evaluated the progress of the implementation. Although the implementation is still on schedule, the evaluation was not so good as expected (Ministry of Agriculture and Forestry (MMM), 2009).

SWEDEN

Sweden faces both threats and opportunities regarding climate change. A Commission on Climate and Vulnerability was organised within the Ministry of Environment. In October 2007, it presented a 680-page report that summarised all the challenges Sweden faces and the information needed to help reduce vulnerability. It also details an array of possible ways, sector by sector, of reducing the vulnerability. The principal features of the climate scenarios, despite uncertainties, were thought to be sufficiently robust to be used as a basis to start adaptation to climate change in Sweden. Hence, the commission concluded that no National Adaptation Strategy was needed as long as the right information was made available to local and regional governments. It proposed that the county administrative boards would be given the task of coordinating climate adaptation work. The Swedish Environmental Protection Agency should be given responsibility for monitoring the climate adaptation work.

ASSESSING THE INSTITUTIONS

National Adaptation Strategies are not institutions. Nevertheless, these strategies have been developed and are being implemented within existing institutional environments, defining the style of policy making and policy implementation in each specific country. In this section, with the help of the six qualities of our analytical framework, we assess the capacity of the governance institutions in the Netherlands, the UK, Finland and Sweden to enable climate change adaptation.

ASSESSING VARIETY

Neither of the strategies discusses other problem frames than those based on the IPCC reports. Within this fixed problem frame each strategy presents a variety of options to adapt to climate change. The Netherlands aims for a mixture of innovative measures and proven strategies to cope with climate change impacts – while the UK and Finland build far more on existing practices of sectors. Sweden and Finland present the most extensive and detailed list of their vulnerabilities and impacts. Whereas the UK, Finland and Sweden address almost all climate-sensitive domains, including energy, economics and human health, the Netherlands has a narrow focus on spatial planning and water management.

The development of all National Adaptation Strategies has been orchestrated top-down, chaired by the ministry responsible for environmental matters and in close cooperation with many scientific experts. The strategy development processes show almost no multi-actor and multi-level involvement and only a little multi-sector involvement through inter-ministerial working groups in the Netherlands and Finland. The involvement of a variety of actors seems to have postponed the implementation of the strategy. All strategies mention the need for inclusion of different stakeholders, like business and citizen, but are clueless about the actual approach of stakeholder participation.

ASSESSING LEARNING

In first instance, the National Strategies show little willingness to learn in terms of listening and discussing doubts. Defense of their own arguments against political disinterest and climate scepticism dominated the discourse. The strategies were presented as a comprehensive thought-out framework with hardly any room left for intensive discussion. Moreover, and in contrast to the Finnish and English strategies, the Dutch have not even set a date to review their Strategy – which could be a good indicator for learning. Just like variety, learning seems to get more attention during the implementation phase. All strategies use the concept of 'learning by doing' to see what measures are effective – and which are not. In the Netherlands the 'Hotspots approach', where adaptation strategies for several vulnerable regions are being developed, provides valuable insights for adaptive strategies at other comparative regions – even outside the Netherlands. Other countries are doing similar things. England, for example, provided examples of good practice. To institutionalise learning processes, the UK and Finland have set up several structures to facilitate learning, such as evaluations and cross-sectoral exchange. European projects directed to an exchange of experiences with adaptation strategies across different European countries must also be mentioned. We have not observed any significant indications for paradigmatic change. In general, double loop learning is hard to achieve when traditional institutions dominate the policy process, that is, all groups were chaired by ministries.

ASSESSING ROOM FOR AUTONOMOUS CHANGE

Continuous monitoring and interpretation of potential climate change impact seems to be highly developed in all countries but are not fully accessible for the general public. Most of these monitoring programmes are being developed to support policy makers in their decision-making process. While publicly accessible information systems are lacking in the Netherlands, the UK and Finland have specially designed programmes to inform all those people interested in adaptation. They provide not only information, but also wizards and interactive maps to assess individual vulnerability and possible adaptation measures. In this way it might accelerate autonomous adaptation. It is a question to what extent these counties provide a culture in which improvising and self-organisation is allowed and stimulated. In Sweden it has been deliberately decided not to develop an overall strategy. This decision provides maximum room for public and private actors to integrate the proposed measures into their own ongoing processes of adaptation. On the opposite position, Finland takes a more plan-like approach with less room for improvising. The Netherlands and the UK try to connect planned change with openness for actor's initiatives. In these cases, the National

Adaptation Strategy operates as an umbrella type of framework in which local and regional actors are challenged to develop innovative strategies. With the exception of Sweden, central government authorities have a central position in guiding climate adaptation. However, this central steering can discourage the ability of actors to adjust to change. The longer people rely on the responsibility of central authorities, the more they will lose their knowledge about how to improvise during periods of crisis.

ASSESSING LEADERSHIP

In our framework we have distinguished between visionary, entrepreneurial and collaborative leadership. The English, Dutch and Finnish Strategies all include visionary elements. But in all three cases there is not one – or many for that matter – leader that is renowned for his or her active contribution to climate change adaptation and has broad societal support. Although the environmental ministries take the lead in climate change adaptation in all three countries, their leadership is not as strong as it could have been. Moreover, their leading role is also contested by other ministries, such as the ministry of water management in the Netherlands. Entrepreneurial leadership has been very visible during the first part of the decision-making process. In spite of all the uncertainties regarding climate change, public leaders managed to organise political support and to get ambitious strategies accepted by the parliaments. All three strategies emphasise the need for cooperation between stakeholders that suffer the consequences of a changing climate. Also in Finland, where the process has been top-down from the offset, special projects were introduced to enhance collaboration between governments and other stakeholders. This sounds – and is – very promising, but little knowledge has been developed about how this is actually going to be implemented. Until now, many of these ideas remain on paper.

ASSESSING RESOURCES

The strategies have been developed by Ministries with plenty of authority to implement the strategy, especially when the objectives are politically supported by the Cabinet/Parliament. However, the actual implementation should take place at the more local and regional level. The English strategy gains political support through the Climate Change Act and the governmental adaptation programme. Since many actions have already taken place at other levels of government, the strategy has little authority. Similar things could be said about the Dutch strategy. In Finland, however, the leading ministry facilitates the implementation through other ministries, giving more authority to the actual implementation. Earmarking finances for climate adaptation is an enormous challenge because of the high investment, low return rates – profits will only become visible in the future. In the Netherlands, there have been discussions about an adaptation fund specifically for implementing the strategy, but these ideas have not been crystallised and are not very popular in times of financial crisis. This is also true for the UK and Finland, but to a lesser extent – there is more governmental support for the actual implementation. The opposite can be said about human resources. In the Netherlands, several dedicated policy makers are working on climate adaptation. In addition, within the scientific community, more and more researchers are including climate change adaptation in their studies. In Finland, the human resources are minor compared to the UK and the Netherlands.

ASSESSING FAIR GOVERNANCE

The process in which the strategies were created has primarily taken place behind closed doors. In Finland and the Netherlands public hearings were organised where only a few people, those who were aware of this process and were interested, reacted. In all cases, scientific information was used to gain legitimacy of the strategies. Division of responsibility is most clearly arranged in Sweden. In the UK, responsibilities are to some extent made transparent through the Climate Change Act, and accountability is guaranteed by foreseeing clear future steps. Responsibility is not well arranged in the Netherlands. The strategy argues for 'collective action' to make the Netherlands climate proof. What this entails and who is responsible for what is not made explicit.

CONCLUSION AND REFLECTION

This paper sought to find an answer to the question, to what extent our historically grown governance institutions can enable society to cope with the new challenges of climate change adaptation. On the basis of an assessment of four National Adaptation Strategies, we can now draw the following general conclusion: although the governance institutions involved have the basic qualities that are required to enable climate change adaptation, several institutional weaknesses may cause difficult tensions and dilemmas, in particular on the long term.

INSTITUTIONAL WEAKNESSES

The first institutional weakness that we have identified concerns the difficulty that political systems traditionally have in being open towards variety and learning. Owing to the long-term character of climate change and the many inherent uncertainties involved, variety and learning were defined as important qualities of institutions (Verweij and Thompson, 2006; Pahl-Wostl *et al*, 2007; Weick and Sutcliffe, 2001). However, our assessment showed that the favourite strategy of policy makers to deal with uncertainties was to focus on and develop only one problem frame. This can be explained by the political institutional context. In general, it is very hard to organise political support and funding through documents that openly address doubts, multiple problem frames and the need for learning. Many of the analysed strategies were a political statement, explaining the need to start adapting to the effects of climate change at all governmental levels (Mickwitz *et al*, 2009). Moreover, on the long term, policies based on one fixed problem frame can conflict with the need to involve different stakeholders for the development a particular adaptation strategy. They will bring with them a variety of knowledge frames, values and risk perceptions, causing confusion, or perhaps even fundamental conflict.

'… important uncertainties and ambiguities exist, which cannot be solved by scientific experts alone'.

The second institutional weakness concerns the strong one-sided reliance on scientific experts. The historical development of the climate issue shows that without advanced knowledge about land use, ocean and atmospheric processes and feedbacks, and sophisticated climate models, climate change most likely would still be a non-issue. At the same time, important uncertainties and ambiguities exist, which cannot be solved by scientific experts alone. In his book

about climate controversies, Mike Hulme (2009) convincingly argued that climate change is both a scientific and a moral issue, challenging the environmental, social, cultural and political dimensions of our society. However, our assessment showed that all National Adaptation Strategies intensively build on the IPCC reports, which can be considered an institutional arrangement to develop agreed-upon knowledge frames, while excluding scepticism.

The tension between top-down policy development and bottom-up implementation is the third institutional weakness that we have identified. The four National Adaptation Strategies have in common that they have postponed variety and learning to the implementation stage. The central argument is that there are no 'best solutions' to accomplish the overall objective of a National Adaptation Strategy. Although this argument is convincing, it is also generally acknowledged that different problems ask for different solutions. Only through experimenting and learning can best practice be developed. Hence, a crucial question is to what extent will the National Adaptation Strategies be able to keep their promise of allowing and encouraging variety and learning in the implementation stage. Within the constraints of the existing governance institutions, which lean towards one-dimensional problem frames and focus on the reduction of complexity, this will not be an easy task.

The fourth institutional weakness concerns the room for autonomous change and can be described as institutionalised distrust in the problem-solving capacity of civil society. Whereas Sweden has decided not to develop a National Adaptation Strategy, other countries did. These countries have built their strategies upon the assumption that existing measures to cope with the projected impacts of climate change are most likely insufficient and that they do not expect that effective adaptation measures will be developed without any form of governmental steering. This can be interpreted as a lack of confidence in the self-organising and adaptive capacity of society, which conflicts with the dominant governance narrative, promoting a shift from hierarchical and well-institutionalised forms of government towards less formalised forms of governance, with room for self-organising networks (Edelenbos, 2005: 129). By taking over responsibilities from civil society, governments will run the risk of creating a situation in which their assumptions of insufficient autonomous adaptation can be confirmed only by it leading to a self-fulfilling prophecy.

'… a lack of confidence in the self-organising and adaptive capacity of society, which conflicts with the dominant governance narrative…'

The fifth and final institutional weakness of governance institutions that we have identified on the basis of our assessment is the 'wicked problem' of reserving funding for the long term. In spite of political support, financial resources are still missing and decisions on funding are often postponed to a later stage of the actual implementation. This stresses a weak aspect of the capacity of governance institutions, namely, dealing with the long-term character of climate adaptation. Finances can be available now, but from a political point of view it is always difficult to reserve these for coping with long-term effects.

REFLECTION

The application of our analytical framework, consisting of six qualities, has

turned out to be a useful means for discussing the strengths and weaknesses of governance institutions. However, as our assessment is mainly based on a secondary analysis of Adaptation Strategies, further discussion and work is needed. In addition, it must be noted that we limited our study to an assessment of four western countries. Obviously, less developed countries are much more vulnerable to climate change (e.g., Al-Jeneid *et al*, 2008). It therefore can be assumed that an assessment of their governance institutions would generate a completely different picture.

To conclude, until now the countries that we have studied manage to align the new challenges of climate change adaptation with the existing governance institutions. However, as institutions carry the bias of previous interactions, views and power relations, they are rather stable and difficult to change (Koppenjan and Klijn, 2004: 214). At the moment, institutional change, therefore, primarily takes place by 'patching up' institutions, rather than replacing them (Blatter, 2003: 504). To deal with the above-mentioned institutional weaknesses, policy processes are required that deal with ambiguity, science-policy interfaces, learning and self-organisation, bearing elements that may conflict with existing institutions. For this reason, special attention is needed for institutional linkages. New rules and roles need to be related to existing institutions if they are to have a chance of being 'picked up', (Edelenbos, 2005: 129), and improve the adaptive capacity of society.

Note

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