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Post-Crisis Reform and Learning
in the Aftermath of the 1998 Sydney Water Crisis

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ABSTRACT

The objective of this paper is to deepen our understanding of post-crisis reform processes and learning through (a) development of a `policy configuration' perspective and (b) a case study of the 1998 Sydney water crisis in New South Wales, Australia, when drinking water became contaminated by potentially lethal parasites: *cryptosporidium* and *giarda*. It explores the way in which the process of reform and learning can be shaped by what this paper calls the `policy configuration' of the particular policies undergoing intense scrutiny. First, the paper lays out the conceptual scene by exploring the nature of `crisis' and `learning', as well as outlining the core aspects of a policy configuration approach. Second, it identifies four hypotheses which focus on the way in which the pre-crisis configuration of a policy sphere, can both help and hinder reform processes (and their advocates) in the wake of a crisis. Third, it focuses on the Sydney water crisis itself, and deals with the course of events, the inquiry, and the aftermath. Fourth, it returns to the policy configuration hypotheses and tests them in the light of the case study. Finally, it concludes by drawing together the analysis and providing some pointers for further research.

Keywords: Crisis, Learning, Reform, Policy Change, Sydney Water

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CONTENTS

1. Introduction

The objective of this paper is to deepen our understanding of post-crisis reform processes and learning through (a) development of a `policy configuration' perspective and (b) a case study of the 1998 Sydney water crisis in New South Wales, Australia, when drinking water became contaminated by potentially lethal parasites: *cryptosporidium* and *giarda*. The purpose is not to determine whether `learning' has occurred. Rather, it is to explore the way in which the process of reform and learning can be shaped by what this paper calls the `policy configuration' of the particular policies undergoing intense scrutiny. The structure of the analysis will be as follows. First, it will set the conceptual scene by exploring the nature of `crisis' and `learning', as well as outlining the core aspects of a policy configuration approach. Second, it identifies four hypotheses which focus on the way in which the pre-crisis configuration of a policy sphere, can both help and hinder reform processes (and their advocates) in the wake of a crisis. Third, it focuses on the Sydney water crisis itself, and deals with the course of events, the inquiry, and the aftermath. Fourth, it returns to the policy configuration hypotheses and tests them in the light of the case study. Finally, it concludes by drawing together the analysis and providing some pointers for further research.

2. Setting the Conceptual Scene: Crisis, Policy Configuration, and Learning

Crises encompass a range of phenomena. They include natural catastrophes (tsunamis, earthquakes and hurricanes) terrorist attacks (World Trade Center, Bali, Madrid), threats to human and animal welfare (SARS, anthrax, foot and mouth), and critical incidents (Kursk submarine, Beslan school siege, Washington sniper). Typically, crises involve severe threats, high uncertainty, and limited time for decision makes to act (Rosenthal et al, 2001). They also provide `focusing events' which concentrate our attention on the weaknesses of individual actions, institutional workings and social processes, creating `open windows' for policy reform (Kingdon, 2003; Birkland, 1997). However, post-crisis reform is neither straightforward nor inevitable. Post-crisis periods are characterised by a tension between forces which pull them in the direction of learning and reform on the one hand, and those which are threatened by change and cling to the status quo on the other (Alink et al, 2001; Boin and t'Hart ,2003; Boin et al, 2005). If we wish to develop our understanding of these tensions, one possibility would be to turn to the increasing number of conceptual approaches which attempt to offer explanations for the forces shaping public policy. These include:

- new institutionalism (the constraints of existing norms, procedures etc)
- rational choice (the self-interest of politicians, bureaucrats and the public)
- interest groups/advocacy coalitions (the power of groups seeking to influence those who make public policy)
- path dependence (inherited decisions heavily constraining choices for the future)
- policy styles (standard attitudes of policy makers to consensus, imposition etc)

This list is by no means exhaustive but the very fact that differing perspectives exist, gives us a sense that our understanding of political life is contested, rather than absolute (Hay, 2002). It also gives a sense that these perspectives are not mutually exclusive. They focus on essentially the same phenomena (the nature of public institutions, the individuals who inhabit them and their relationship to wider civil society and public life) but from different angles.

It would be quite possible to explore each of the foregoing perspectives in relation to the Sydney water crisis and it is likely that there would be much benefit in doing so. We could examine the competition between coalitions of interests, or the tensions between institutional stability and institutional change in the wake of a crisis. However, having reviewed a wide range of public policy literature, it seems useful to suggest that we can enhance our understanding of post-crisis learning, by adding a new layer of analysis which can be called a `policy configuration' approach. The thinking behind this begins with various definitions of `policy'. For example, Dye (2005: 1) describes it as `whatever governments choose to do or not to do'. Dror (1983: 14) defines it as `general directives…on the mains lines of actions to be followed'. Heclo (1972: 85) defines it as a `course of action or inaction rather than specific decisions or actions'. A common theme throughout these and many other definitions of policy is that they concern authoritative choices - whether this is to act or not to act. In the event of a crisis, these choices are subject to intense scrutiny and challenge. Therefore, a policy configuration perspective suggests that learning and reform processes in the wake of a crisis in a particular policy sphere (e.g. water, transport, health), will be shaped by the pre-existing profile of the cluster of authoritative choices which comprise that policy sphere. To use an analogy, policy configuration is the policy `raw material' which has inherent characteristics which make it malleable and/or resistant to reshaping. We might easily dispute what the components of a `profile' actually are, but the suggestion here is to break it down into three factors. It is not possible to completely disentangle them from explanations which focus on institutions, interests or others, but the intention is to give a sense of pre-existing `policy' and its influence. Therefore, the configuration of a policy area concerns:

1. Choices made and instruments used
2. Distribution of choices across different institutional structures
3. Stability or otherwise of choices

This paper does not suggest that exploring these provides a solitary, all-encompassing explanation of post-crisis periods. Rather, it suggests that there is merit in examining `policy configuration', because it offers a new perspective on factors which both help and hinder post-crisis reform amidst the contest between proponents and opponents of reform. In essence, how a policy is configured, can facilitate both `fluidity' and `stickiness'. Some hypotheses will be developed shortly. Before doing so, it is necessary to explore the `learning' aspect of post-crisis learning.

The term learning has a Hegelian tone. In popular discourse, learning is rarely seen in a negative light. Instead, it seems to convey the gradual unfolding of wisdom, towards higher and higher form of knowledge. Toft and Reynolds (1997) make a useful distinction between passive learning (knowing something but failing to act on it) and active learning (knowing something and being prepared to act and initiate change). In the context of post-crisis situations, even although political actors, institutions and interests may differ in their interpretations and views, a common dominator is that the `truth' is somehow out there - waiting to be discovered, recognised and acted upon. In essence, the discourse of policy learning is that it is more than simply `knowing' – it also includes `acting'. Mechanisms of public accountability help ensure that when policymakers establish post-crisis inquiries, the rhetoric (at least) is a degree of willingness to `learn'. For example, in the wake of the 2001 foot and mouth disease crisis in the UK, an inquiry was established by the Blair Government with the very title Lessons to be Learned (HC 888, 2002). The Preface to the 9/11 Commission report stated that its aim was `to provide the fullest possible account of the events surrounding 9/11 and identify lessons learned' (National Commission on Terrorist Attacks Upon the United States, 2004: xvi). Typical questions in such post crises inquiries are: What went wrong? Couldn't we have been more effective in managing the crisis? What lessons should we learn to avoid future mistakes? However, our earlier reflections on the contestability of policy processes suggest that a single `truth' or `wisdom' is relative rather than absolute. Bovens and t'Hart (1996), exemplify this view in providing useful typologies which indicate that causes of failure may be viewed as residing at the individual, institutional and/or systemic levels. Even natural disasters are the product of crisis triggers (tsunamis, hurricanes, mud slides etc) and vulnerable social conditions (poor housing construction, low income groups, lack of disaster preparedness and so on) (Blaike et al, 1994). Crises, therefore, are social. Let us give two examples of the implications for the post- crisis accumulation of knowledge about such events.

First, when we try to find out `what went wrong', it is not just about finding out how the world works, but it is also about assigning responsibility and placing burdens on one set of people as opposed to another (Stone, 2002; Brändström and Kuipers, 2003). A retort might be – but what about technical reasons for failure? Surely there is common agreement on these? For example, in the Kings Cross Fire in 1987, there is little dispute that a lighted match dropped down an escalator and set fire to an accumulation of flammable debris (Fennell, 1988). In the 1986 Space Shuttle Disaster, there is little dispute that the explosion was caused by a combination of low air temperatures, hot gases and erosion of an O-ring in the solid rocket booster. However, technical causes are themselves subject to forensic debate and contention, and they also have social contexts at the individual, institutional and societal levels. In the case of Kings Cross, many issues are still subject to interpretation and debate. For example, was it arson or accident? Were the Thatcher Government's budgetary reductions for London Regional Transport a factor in inadequate spending on safety matters, or were such deficiencies a product of managerial weaknesses? These are the sorts of questions which arise when technical `causes' are placed in a social context. Second, when we examine whether or not a crisis was well managed, we immediately confront classic policy analysis questions in relation to evaluation: What standards should we use to judge? Well managed in whose interests? Over what time period and so on? (Hogwood and Gunn, 1988; Dunn, 2004). For example, were the 2000 fuel protests in the UK well handled or badly handled because the Blair government helped resolve the dispute but only because it went against its original goal of refusing to give in to the demands of fuel protestors engaging in civil disobedience? (Robinson, 2003). Or, in the 2004 siege of a school in Beslan by Chechen rebels, should the actions of the local federal security authorities be partially vindicated because more than 700 escaped, or vilified because at least 340 children and adults died? Evaluating crisis management activities is riddled with such difficult methodological issues (McConnell, 2003).

The broader implications for post-crisis learning are profound. As Fischer (2003: 11) suggests:

In short, learning for one person may not be learning for another person with a different political ideology. No amount of data, regardless of how well tested and verified it might be, will convince a person that anything important or useful has been presented if, in his or her view, the findings lead to policy judgements that take him or her in the wrong direction…For such a person, the findings will not be considered learning per se. Or, alternatively, if they are, they will not be viewed positively.

In effect, if the causes of crises and the manner of their handling are contested and relative to our perceptions, then `learning' in the aftermath is equally a matter of contest. As a wealth of policy analysis studies show, political contest over problems and solutions is part of the very fabric of public policy (Edelman, 1988; Howlett and Ramesh, 2003; Stone 2003). It throws up classic debates about the `best' way forward: the state vs. the market, regulation vs. voluntarism and so on. Therefore, when we study post-crisis learning, it should most usefully be seen as studying post-crisis contestation and adaptive behaviour, rather than a search for ideal-type `lessons'. It is in this context that we arrive at attempts to understand post-crisis learning.

The argument here is that there is merit to be gained by focusing not on political contest (although this is not to deny that it is crucial), but by focusing on how the configuration of a policy area – the profile of the pre-existing cluster of authoritative choices - helps shape `learning' in the aftermath of a crisis. This is the basis on which this paper now proceeds. It advances four policy configuration hypotheses in relation to post-crisis learning. The first two hinder the process of post-crisis learning and transformation while the second two assist it.[1]

3. The Influence of Policy Configuration on Post-Crisis Reform and Learning: Some Hypotheses

Hypothesis 1: The greater the degree to which authoritative choices in a policy sphere are divided `vertically' between different levels of government or governance, the less conducive this is to policy reform after a crisis.

Political systems are multi-layered, and therefore the responsibility for choices affecting policy transport, health, education, internal security and so on, are divided `vertically' between these layers. The nature of the spread will depend on the nature on the political system. Federal systems such as those in Canada, Germany Australia and the USA, have these vertical division of powers entrenched in constitutions, and generally grant greater autonomy and protection for sub-national choices. Correspondingly, in unitary/union states such as UK, France, New Zealand and Japan, sub-national choices have less protection and are dependent on the wishes of the national legislature. Added to this for the 25 EU states of UK, France, Netherlands and Sweden and the others, is a supra-national layer of governance which has all the characteristics of a political system in its own right, as well as being able to produce laws which have primacy over laws produced in member states (Hix, 1999; Nugent, 2002). Whatever the precise relationships, the basic premise of this hypothesis is that authoritative choices taken at many levels, are much less likely to produce co-ordinated reform in the wake of a crisis, than choices which are taken at only one level. There are two particular aspects of this which are relevant to post-crisis situations. They are not mutually exclusive but we can treat them separately for present purposes.

First, policymakers at the national and supra-national levels, cannot exercise complete control over the lower levels. Indeed, by their very nature: (a) the evolution of sub-national autonomy over authoritative choices (in all states) and (b) national autonomy in relation to the supra-national level (in the case of EU states), indicate that a completely centralist concentration of power is not compatible with political, economic or social stability. The degree of independence from the `centre' will vary from system to system, from time to time and even from issue to issue. Some such as Rhodes (1988, 1996) have been to keen to bring to our attention the existence of a `differentiated polity' where sub-national government poses serious difficulties for national government (and in the case of the UK, call into question its characterisation as a unitary state). With regard to the EU, and even despite its quasi-federal characteristics, considerable national autonomy exists because its legitimacy depends on the dual democracy of national and supra-national power sharing (Judge and Earnshaw, 2003). Indeed, apart from the EU's Common Commercial policy which is effectively a common policy on trade with non-member states, all EU policy areas share powers of authoritative choices with nation states. The overall implication of the above for post-crisis situations, is that reform of authoritative choices is not simply a matter of upper level choices cascading down to lower levels. An example of `top-down' problems of post-crisis reform can be found in the example of BSE in Europe. After the height of the crisis in the early 1990s and a ban on British beef exports, longer-term attempts by the EU to reinstall a free market in beef were not implemented by France (because of its food safety concerns) and Germany (for constitutional reasons) (Vincent, 2004). In effect, the EU took a policy

[1] It should be noted that that it not always possible to draw a clear line between (a) the immediate crisis response and (b) reform and learning. Often, responding to the crisis and trying to stabilise a situation, requires swift reform measures being put in place.

choice – based on the assumption that reform meant a restoration of the status quo ante – and this was not implemented at all `lower' levels of governance.

A second dimension to the hypothesis concerns the fact that in many political systems, policy makers and legislatures are not constitutionally sovereign over their own affairs. This applies to all sub-national policy makers who in some way draw their powers `vertically' from national governments or written constitutions, and to EU states where EU law has primacy over domestic laws. Therefore, in post-crisis situations when the cluster of existing authoritative choices is subject to intense scrutiny, those advocating reform must act within `vertical' constraints. Constitutional or quasi-constitutional factors may ensure that in a particular policy area in a post-crisis situation, a lower level of government may not have the right to make the sorts of authoritative choices that it feels necessary for reform, because other relevant authoritative choices are vested in a higher level of government or governance. The issue of independence for Quebec is a case in point. The Canadian province has struggled with recurring crises of identity and sovereignty, but its powers of authoritative choice have been blunted because (and despite holding referenda in 1980 and 1995) it cannot declare itself independent within the confines of the authoritative choices of the Canadian constitution (Simeon, 2000). It should also be noted that sub-national decision makers – even if they have the formal power of authoritative choice – may have the `purse strings' held by a higher level of government, effectively limiting that choice.

Overall, these examples and those mentioned previously, are indicative of this first hypothesis. The greater the `vertical' divisions in powers of authoritative choice, the more difficult it is for proponents of reform to achieve their aims in the aftermath of a crisis.

Hypothesis 2: The greater the degree to which authoritative choices in a policy sphere overlap `horizontally' with other choices at the same level of government or governance, the less conducive this is to policy reform after a crisis.

Choices in one policy area very often overlap with choices in other policy areas made at the same level of government or governance. For example, in most developed countries, transport policy and the building of roads, levying of tolls and taxing of vehicles, overlaps with environmental policy and its attitude to conservation, pollution controls and so on. Indeed, many developed countries are explicitly adopting the approach of policy linkages. Sometimes they are intertwined because government (national and sub-national) seek to promote cross-cutting initiatives such as sustainable development, e-governance, or continuous performance improvement. At other times, the linkages extend to a deeper institutional and policy co-ordination in some form of `joined up' or partnership approach (Ling, 2002; Pollitt, 2003). Examples include Centrelink in Australia which offers a `one stop shop' for citizens accessing services from ten government departments, the Strengthening Families programme in New Zealand which requires strong inter-departmental co-ordination, and US federal-state partnerships for programmes such as SafeCities and the Child Care Partnership (Ling, 2002).

A recent revival in implementation studies recognises that successful implementation requires the coordination of `horizontal' networks (Schofield and Sausman, 2004; Exworthy and Powell 2004). A similar point lies at the heart of this hypothesis. Whether policy linkages are at the traditional, cross-cutting or joined up levels, the greater the degree of interface, the more difficult it is for advocates of reform because it requires the horizontal co-ordination of choices which are rooted in different organisational values, priorities, cultures and traditions. For example, in the post 9/11 period, homeland security in the US has been characterised at both local and state levels, by serious weakness (and often the complete lack of) horizontal collaboration. Very few states or localities can `go it alone' because of resource constraints, and the difficulties of cross border collaboration in the context of a federal tradition which grants considerable discretion to the states i.e. it is more of a framework approach than a detailed, hierarchical one. This produces a horizontal unevenness in terms of structures, powers and responsibilities, making collaboration very difficult (Wise and Nader, 2002). In the UK, the enormous drive by the Blair Government to require and promote partnership working at the local government level, has created such a range of horizontal ties between local authorities and a plethora of quasi-non governmental organizations, that it has resulted in a `congested state' and a challenge to local political sovereignties (Skelcher, 2004; Exworthy and Powell, 2004). As a consequence, the ability of individual local authorities to produce their own learning and reform in relation to homelessness, crime and other ongoing crisis issues, has been severely compromised. Problems of horizontal overlap can even occur between countries. The ability of California to provide long term solutions to pollution from the New River – the `dirtiest river in the United States' which flows across the border from Mexico – has `hollowed out' US capacity for regulatory reform (Coates, 2004).

Overall, these are examples which are indicative of the main proposition of this second hypothesis, Horizontal overlap between authoritative choices makes it more difficult to reform one particular cluster of authoritative choices in the aftermath of a crisis.

Hypothesis 3: Authoritative choices in a policy sphere which involve a mix of state, market and voluntary-based policy instruments, are more conducive to post-crisis reform, than those which rely predominately on one type of policy instrument.

If policy is broadly about policymakers' choices to act or not act, then a further stage of analysis to identify what policy instruments they are using in making these choices. Policy instruments may be categorised in a number of ways. Hood (1986) adopts the categories of nodality, (information), treasure (resources), authority (commanding, permitting etc) and organisation (direct government action). Bardach (2000) provides a more extensive listing of 11 activities of government, ranging from levying taxes to reforming bureaucracies. Whichever way we wish to categorise these policy instruments, each is underpinned by different conceptions about the role of government and the state in dealing with problems. Some are state-centric where the state plays a significant role in direct provision (such as healthcare systems in the UK, Australia, Canada and Sweden), or in state regulation of environmental pollutants, food production, energy markets, safety standards in transportation networks, technological advancements such as cloning, and all the other manifestations of what Beck (1999) has famously called the `World Risk Society'. Other instruments are much more market-based, leaving the `fixing' of problems to the laws of supply and demand. In Britain, the mantra of the early years of the 1979-90 Thatcher Governments was that the only way to learn lessons from the political and economic crises of the 1970s was to rely on the free market rather than resorting to traditional, `socialist' and Keynesian-style state intervention. More generally of course, there has been a policy instrument drift in this direction over the past couple of decades (albeit accompanied by regulation regimes), towards the market-based solutions of privatisation, market testing, contracting out of public services and so on (Pollitt and Bouckaert, 2000; Bovaird and Lőffler, 2003). Other instruments are voluntary based, where `problems' are dealt with principally by individuals, families and voluntary groups such as Oxfam, Red Cross, Salvation Army and so on.

The basis of this hypothesis is that in a policy area where the range of instruments is already underpinned by ideological justifications for state, market and voluntarism, then the potential for fluidity in authoritative choice already exists. By contrast, a policy sphere dominated by one type of solution is less amenable to reform in the wake of a crisis because the ideological frame is much narrower and the range of options more limited. The Common Agricultural Policy of the EU is a classic example. Its history has been characterised by a state of near perpetual crisis, particularly in the early 1980s when it took up almost 80% of the European Community (EC) budget and brought the EC to near bankruptcy (Grant, 1997). The dominant paradigm has been one which is highly interventionist in the production, supply and pricing of agricultural products, rather than leaving such matters to the market mechanism. All the various interests of farmers, members states and EC/EU institutions (particularly the European Commission) have become locked into the institutional arrangements which accompany this interventionism (Daugbjerg, 1999). Radical market-based reforms in the wake of regular crises of budgets, surpluses and so on, have never been high on the EU agenda, resulting in only the most incremental of reforms over the past two decades or so.

It is of course possible to envisage a counter factual: that post-crisis reform is easier <u>within</u> the frame of certain policy types of policy instruments. However, the hypothesis identified here is one based on relativity. Policy spheres where instruments and intellectual underpinnings in relation to the state, market and voluntarism are widely dispersed, have a wider frame to draw upon than spheres which rely predominantly on one. Therefore, all things being equal, they are more conducive to reform during periods of post-crisis contestation and `learning'.

Hypothesis 4: In historical terms, a greater frequency in the reform of authoritative choices within a given policy sphere, increases the possibility of reform in the aftermath of a crisis.

When any cluster of authoritative choices is subject to the intense scrutiny that flows from a crisis situation, this does not happen in a historical vacuum. Policy makers inherit legacies in that policy area i.e. of reform or its absence. This is different from arguments relating to `policy inheritance' or `path dependency' where policy makers inherit institutional structures and policy choices which are the principal determinates of future choices (Rose, 1990; Peters, 1999). What is being `inherited' in the context of this hypothesis is not the pre-existing structures or choices, but the experiences (or lack of them) in relation to reform of these choices. Therefore, the hypothesis suggests that authoritative choices which have a legacy of frequent change, are less secure and more likely to produce post-crisis reform than if the opposite is the case. It is possible of course to cite a counter-factual. Regular reforms may create a reform `fatigue'. However, for policy makers - all things being equal - a historical legacy of `reform' means that `change' (even if reluctant) is already part of recent discourse, and interests which might offer resistance are less established. For example, in the early 1990s, Blackburn (1992: 5) epitomised the views of many when he wrote about the `ruins' of the Westminster Parliament (challenged by rival power centres in Scotland, Wales Northern Ireland, and the European Union) as well as by the vagaries of the first past the post electoral system and the absence of a Bill of Rights. When Labour was elected in 1997, its substantial Commons majority was crucial in providing it with the power for reform, but the sheer scale of the reforms were considerable, and far beyond the experiences of a country like Canada which (as mentioned above) struggled with only one substantial constitutional issue (Simeon, 2000). The Blair Government in the UK introduced at least 16 bills on constitutional issues in its first term, covering areas such as the establishing of a Scottish Parliament, reform of the House of Lords and the incorporation of the European Convention on Human Rights into British law. In essence, the Blair Government's attempt to learn from ongoing `crisis' issues in constitutional policy, was made easier by the sheer momentum of reform; each piece contributing to further `open windows' for reform (Kingdon, 2003).

To recap: we have now identified the nature of and rationale for four `policy configuration hypotheses. It is argued that each sheds some light on how the pre-existing `raw material' of authoritative choices in a policy sphere, may both help and hinder post crisis reform processes. Further exploration of these can now be undertaken via a case study of water contamination in Sydney.

4. The Sydney Water Crisis 1998

Brief Context

Australia has a federal system of government, with powers separated and shared between the federal government and the six states and two territories (Sharman and Moon, 2003). The largest state in population terms in New South Wales, the capital of which is Sydney, with a population of just over four million. In 1998, responsibility for Sydney's water supply and the disposal of sewage and wastewater, lay with a complex range of bodies (a point to which we will return later) but primary responsibility lay with Sydney Water, a state owned corporation which came into being in 1995 as a replacement for the Sydney Water Board (Sheil, 2000: 92-101). Not only were institutional arrangements complex, but infrastructure was geographically highly dispersed. Sydney used approximately 1600 million litres of water daily, involving almost 200 pumping stations, four main river systems and eleven treatment plants (McClellan, 1998a). However, in times of normal rainfall, as much as 97% of Sydney's water came from the two catchments at Warragamba and the Upper Nepean (McClellan, 1998c). Most of this, about 85%, came by pipeline from one facility - the Prospect filtration plant (McClellan, 1998a). In terms of issues surrounding water quality, Sydney Water did not have sole responsibility. Notably, the NSW Department of Health had a statutory responsibility for public health, and therefore the power of intervention to restrict or prevent the usage of water for domestic/drinking purposes.

The particular contaminants at the centre of the crisis were

Cryptosporidium and *Giardia*. They are parasites which can reproduce only inside the guts of humans and animals. When they are shed in faeces and come into contact with humans (though routes ranging from food contamination to contamination of drinking water), ill heath and even death can result. *Cryptosporidium* comes in a variety of forms, but only *Cryptosporidium parvum* is capable of causing disease in humans. It can produce symptoms such as nausea, cramps, and flu-like feelings for several weeks. It is resistant to normal chlorine treatment and there is no known effective medical cure. Most people who are infected recover eventually in a couple of weeks, but in the case of vulnerable individuals with compromised immune systems (the young, the elderly, individuals who have undergone transplants, cancer treatment, or who have developed AIDS), it can cause death (McClellan, 1998a). *Giardia* is less severe or robust. It can be killed by normal water treatments and its impact is limited except under rare circumstances to acute or chronic diarrhoea for several weeks (if patients are treated with the drugs *metronidazole* or *tinidazole*) and up to six weeks if left untreated. In early 1998, world wide medical knowledge of the two parasites was at a low stage of development, and neither Australia, New Zealand, the US nor Canada had national regulations for `acceptable' levels of the parasites, or prescribed monitoring systems (McClellan, 1998e). Testing was also lengthy, complex, difficult, costly and not guaranteed to produce definitive results. In the US, Europe and Japan, there had been four *Cryptosporidium* outbreaks in the 1980s and another 15 by 1996 (Sheil, 2000: 102). The most famous case was in 1993 in the US city of Milwaukee, when 403,000 people became ill as a result of *cryptosporidiosis* and over 100 people died (McClellan, 1998a).

The Course of Events: A Summary

The crisis can be broken down into three events and each can be considered in turn (McClellan, 1998e; Stein, 1998; Healy 2001). The first event began to slowly unfold on Tuesday 21 July 1998, when low levels of *Cryptosporidium* and *Giardia* were detected as part of routine sampling at the Prospect distribution chamber and Potts Hill reservoir. Sydney Water activated its incident management process and, in accordance with the Memorandum of Understanding with NSW Health, notified its Environmental Health Branch. Over the period Tuesday 21st to Saturday 25th July, several samples were taken from the previous test sites and surrounding areas (McClellan, 1998a, 1998e). Results varied from all-clear to low level contamination. The highest levels were found near Sydney Hospital, but this was considered by all parties to be a localised problem that could be dealt with by local engineers and a flushing of the system (McClellan, 1998a).

On Saturday 25th and Sunday 26th, the situation changed when high and then extremely high results were found at other localised sites. The next few days were to mark the critical phase in the first event (McClellan, 1998a). They were characterised by major conflicts and communication breakdowns between Sydney Water (with an interest in protecting its corporate reputation) and NSW Health (with an interest in public health); differing interpretations of further results; disputes over whether a boil water alert should be issued and how this should be communicated to the media and householders, an attempt by Sydney Water to "kill" a press release issued by NSW Health, and the Minister responsible for Sydney Water's Operating License not being made aware of the contaminations at all! (see McClellan, 1998a, 1998e; Carson and White, 1998; Stein, 2000; Healy, 2001). The issue was particularly critical because by Wed 29th, test results indicated a strong possibility that the source of the contamination was Prospect – the plant that supplied the vast bulk of water to the City of Sydney. With conflict between Sydney Water and NSW Health ongoing, Craig Knowles the Minister for Urban Affairs and Planning, assumed a major role in managing the crisis. Later that day, the Premier Bob Carr announced the setting up of an inquiry, chaired by Peter McClellan QC. Its terms of reference were wide ranging, and covered the causes and circumstances of the contamination, as well as management procedures, informing the community, and the wider structural arrangements for the processing, monitoring and supply of water. The following day, an expert panel was established to advise Ministers and review test results. Some confusion remained (caused particularly by an incorrect public statement from Chris Pollett, the Managing Director of Sydney Water, that the Prospect system was being bypassed), but by Tuesday 4th August, Sydney was given the all clear, and the advice to boil water was removed. What had become known as the first event was now over.

Further raw water testing continued (including several low level positive readings, although the expert panel refrained from issuing a boil water alert), and the second event began on Monday 24th August when very high readings were discovered at Prospect, the Warragamba and Darlinghurst. In response, NSW Health issued a boil water alert and conducted a further series of tests. A number of high readings were found in and around Prospect, as well as another half dozen sites, including Cranebrook and Glenbrook (McClellan, 1998e). By 4th September, however, all areas were clear and the boil water alert was lifted for the entire Sydney area. McClellan (1998e) considered the initial problems to be largely resolved and this second event to have been handled satisfactorily.

The third event began the following day on 5th September. High readings for *Cryptosporidium* and *Giardia* were found once again at Prospect, as well as the Warragamba dam pipeline, Pennant Hills and Castle Hill (McClellan, 1998e). The boil water alert was reinstated and extended for a further two weeks. During this time, various positive readings were detected at over a dozen sites. Gradually, the number of positive readings diminished, and on 19th September, the boil water alert was lifted for the final time (McClellan, 1998e).

Throughout the course of the previous two months, one startling fact is that no-one died and indeed it is unlikely that anyone got sick. The Inquiry was unable to reach a definite conclusion as to why this was the case, other than the possibility that it was due to the strain of contaminants, the viability of the organisms, or other unknown reasons (McClellan, 1998e). Nevertheless, high contamination levels constitute threats in themselves, and this is enough to put public authorities in `crisis' mode. There is little doubt that public trust in the water supply and faith in key public figures declined as a result of the crisis. In research conducted by Sydney Water after the third event, 72% of respondents felt that profit was put before water quality (Stein, 2000: 433). The bulk of media and public criticism was aimed at Sydney Water, and its two key public figures (Managing Director Chris Pollett and Chairman David Hill) both of whom stood down shortly after the crisis. By contrast, not only did the ruling Labor Party in NSW managed to avoid a great deal of the flak, it was galvanised somewhat by Ministers `telling the truth' (that Sydney's Water was unsafe to drink and the cause of the contamination was unknown), and opinion poll ratings increased marginally during the crisis (Smith, 2001; West and Morris, 2003). However, whatever the political costs/benefits, there were also economic costs. Precise figures have never been ascertained, although the cost to Sydney Water alone was $A41m, with a further $A14m in insurance claims (Sydney Water, 1999: 27).

In terms of the Inquiry itself and longer-term reform issues, five reports were produced over the period August-December 1998 by the McClellan inquiry. These dealt with (i) possible causes of contamination (ii) the management of the first event (iii) health issues and laboratory work (iv) the Prospect plant's tender process and contract arrangements and (v) conclusions and recommendations. An analysis of a very wide range of public documents and debates around this time and subsequently has not yielded a single criticism of this inquiry. McClellan seems to have conducted his investigations with speed, thoroughness, determination, and a willingness to criticise when necessary. The fact that the inquiry reported while further contamination threats occurred, assisted the processes of short term reform in aid of crisis management. For example, the first inquiry report was produced on 19th August, focusing on the causes of contamination of the water supply (McClellan, 1998a). In essence, no definitive source of the contamination was found, but the inquiry made progress on management matters. Notably, it was influential in transferring public notifying of incidents solely to NSW Health, and in producing a new draft protocol for future events. This greatly assisted the management of the second and third events.

The final report produced 91 recommendations (McClellan, 1998e). None of these was for mandatory water quality controls (because of what it described as the `science of uncertainty' surrounding *cryptosporidium* and *giarda*.). However, recommendations of particular significance were that:

- A separate catchment authority should be established with responsibility for water quality.
- Sydney Water and the new catchment authority should be subject to great powers of ministerial control.

- The Environmental Protection Agency should be the primary regulator for the catchment.
- The License Regulator should be restructured as the Water Auditor with powers to review all parties in meeting water quality objectives and catchment strategies.
- Sydney Water and NSW Health should develop a comprehensive incident management plan, as well as refining their procedures and undertaking staff training.
- NSW Health should have clear authority for public health alerts.
- A community education programme should be developed.
- There should be a review of the operating license for Sydney Water and the catchment authority to ensure clarity in their obligations in relation to customer, health and environmental outcomes.

A detailed review of all the recommendations and the Government's response would require a separate research paper. Suffice to say that the vast majority of recommendations were implemented, although the `devil is in the detail' and several key reforms were compromised to an extent by other factors. We can now explore this in the context of the four hypotheses.

5. The Four Policy Configuration Hypotheses and the Sydney Water Crisis

The basic premise of the first part of this paper was that configuration of pre-crisis policy choices will have some impact on post-crisis processes. In particular, the profile of these choices may help and/or hinder those who advocate post-crisis reform. This basic contention was fleshed out through four hypotheses. We can now return to each and apply them to the aftermath of the 1998 Sydney water crisis.

Hypothesis 1: Vertical Constraints

The first hypothesis suggests that the greater the degree to which authoritative choices in a policy sphere are divided `vertically' between different levels of government or governance, the less conducive this is to policy reform after a crisis. At first glance, water policy in Sydney seems to be the responsibility of the state of NSW. Through legislation and/or policy guidelines and directives, it establishes the institutional structures, processes and key authoritative choices for all aspects of water provision. However, the reality is less straightforward. The federal/commonwealth government has powers of authoritative choice in a number of ways but two are particularly important. First, it makes choices in relation to the environment which constrain the choices of NSW and all the states and territories. The constitution does not mention environmental matters (indicating that these should be the responsibility of the states and territories) but a High Court ruling in 1976 empowered the Commonwealth to regulate activities for the purposes of environmental protection and conservation (Senate Environment, Communications, Information and the Arts References Committee, 2002: 212-213). Therefore, from 1992 onwards, it developed the National Water Quality Management Strategy, which included drinking water quality, monitoring and reporting, as well as stormwater management, sewerage systems and effluent management (Senate Environment, Communications, Information and the Arts References Committee, 2002: 215). Second, the Commonwealth exercises considerable constraints on `lower' choices through its National Competition Policy (NCP). The key agenda setters here were the 1993 Hilmer Report on national competition policy, a 1994 agreement by the Council for Australian Governments (COAG), and subsequent legislation in 1995. The core focus was on reducing inefficiencies in the natural monopolies of gas, water, electricity and others, by exposing them to competitive pressures. More specifically, it (i) required the states and territories to ensure parity of regulation across the public and private sectors (ii) required them to corporatise their trading enterprises, and (iii) offered indexed annual grants which would be payable only if NCP objectives were met. These three factors combined had an enormous `vertical' impact on water provision in New South Wales because it meant that all aspects of NSW water planning, pricing, monitoring, regulation and delivery were constrained by these `constitutionally' higher level choices (Seebhom, 2001).

Such constraints helped produce a `stickiness' in relation to the aftermath of the Sydney water crisis. As we have seen, the McClellan inquiry recommended several key reforms with substantial policy implications. Two in particular are relevant here:

- Creation of a separate catchment management authority, with its priority being the protection of water quality rather than commercial considerations.

- The Operating License Minister being able to give direction to Sydney Water and the catchment authority when circumstances require.

The response of the NSW Carr Labor Government to the crisis itself and also the McClellan Inquiry did indeed have a reform imperative. Of particular importance was the fact that Sydney was due to host the Olympic Games in 2000 and it could not afford to create the perception (nationally or internationally) that a major aspect of its public health infrastructure was at risk. There was also an NSW election looming in March 1999. However, the source of the water contamination was never found, and so a surrogate for fixing the problem became introducing reforms which paid heed to the McClellan Inquiry. In this regard, whatever the thoughts of key figures such as the Premier Bob Carr, such `fixing' choices of was shaped and constrained by federal level choices. Reforms took place which were less ambitious on closer inspection. The Sydney Catchment Authority (SCA) was established in 1999, with its main responsibilities being for catchment management, protection and enhancement of water quality, and supplying bulk water to Sydney Water and other users (Smith, 2004). However, the Sydney Water Catchment Management Act 1998 also requires that the SCA has as one of its objectives, the economic and efficient use of infrastructure in accordance with sound commercial pressures. In practice, this has meant a statutory framework set by the NSW Treasury which involves requirements for rates of return, dividends and debt levels. The NSW Treasury is in itself simply applying the requirements and responding to the financial incentives of COAG's Water Reform Agreement and the Commonwealth Government's National Competition Policy. The Operating License also allows the minister to give direction to SCA and Sydney Water, although this is not a case of non-commercial `public interest' routinely prevailing over commercial pressures. The 1998 Act places commercial limits on ministerial direction if the SCA Board feels that the SCA would suffer significant financial loss or if it would not be in its commercial interests.

Overall, there seems to be a strong element of support for the first hypothesis as applied to the aftermath of the Sydney water crisis. NSW authoritative choices over water policy were constrained by federal-level authoritative choices – over the environment in general, but especially by a national competition policy which effectively placed limits on NSW water reforms. Whether this is desirable or undesirable is another matter, but what it does illustrate is that substantial vertical divisions of authoritative choice in a policy sphere are (all things being equal) more liable to favour the advocates of the status quo in the aftermath of a crisis focused on the sub-national level.

Hypothesis 2: Horizontal Constraints

The second hypothesis suggests that the greater the degree to which authoritative choices in a policy sphere overlap `horizontally' with other choices at the same level of government or governance, the less amenable this is to policy reform after a crisis. Prior to 1995, water authorities in Australia tended to be fairly centralised government-owned bodies with responsibility for most aspects of water provision (Senate Environment, Communications, Information and the Arts References Committee, 2002). In NSW, the Sydney Water Board had primary responsibility (beyond ministerial level) for water provision. There was some dispersal of authoritative choice as a consequence of water as a classical issue which cut across departmental portfolios such as land use and environmental protection, however this fragmentation was heightened by the post-Hilmer efficiency drives which broke up a water monopoly and led to the separation of water provision, management and regulation across departments and an increased number of agencies. As a consequence, water policy in NSW became an example of horizontal overlap *par excellence*. The McClellan Inquiry summarised the range of NSW state-level departments and groups which were involved in the management of the outer catchment which supplies drinking to Sydney. They were Sydney Water (including its commercial subsidiaries Australian Water Technologies, Water Eco Science and AWT International), Department of Land & Water Conservation, Environment Protection Authority, NSW Health, National Parks & Wildlife Service, Department of Urban Affairs and Planning, Department of Mineral Resources, NSW Agriculture, NSW Fisheries, local councils, License Regulator, Independent Pricing & Regulatory Tribunal, Hawkesbury Nepean Catchment Management Trust and three catchment management committees (McClellan, 1998c). McClellan (1998c) suggested that `The management and regulatory arrangements in the catchment are obviously complex. There are a large number of government and non-government agencies operating with fragmented responsibilities, potential overlaps and gaps'. Its solution – adopted by the Carr Government – was for an integrated catchment management authority. It can be argued that McClellan's recommendations were minimalist, in the sense that *real politick* meant that creating one body to make authoritative catchment management choices, was more feasible than wider abolition and/or substantial reform of virtually every government department, local councils and a range of groups and agencies. Four years after the crisis, this fragmentation still existed. Professor Cullen of the CRC for Freshwater Ecology suggested that:

We have largely different organisations or sections of individual organisations responsible for land use planning, catchment management, water supply, sewerage provision and stormwater management… We have separate regulatory responsible for assurance of human health, assurance of ecosystem heath and for financial management, and these regulatory aspects appear to operate in complete isolation (Senate Environment, Communications, Information and the Arts References Committee, 2002: 221).

Reflecting on this fragmentation, a Commonwealth Senate inquiry into the water industry found `parallel infrastructures, and an institutional heritage which is difficult to budge' (Senate Environment, Communications, Information and the Arts References Committee, 2002: 218). It also found this complexity to be `undermining the capacity of Australia to achieve genuine water reform and sustainable urban water use' (Senate Environment, Communications, Information and the Arts References Committee, 2002: 229).

Overall, pre-existing state-level complexity and overlap in authoritative choices in relation to NSW remained substantially the same, both pre-and post crisis. It does not seem unreasonable to suggest, that this provides broad support for this second hypothesis. The greater the degree of horizontal overlap in choices within a policy sphere, the more difficult it is to reform in a post-crisis situation.

Hypothesis 3: Range of Policy Instruments

The basis of this hypothesis is that authoritative choices in a policy sphere which involve a mix of state, market and voluntary-based policy instruments, are more amenable to post-crisis reform than spheres which rely predominately on one type of policy instrument. The reason is that the intellectual underpinnings for elements of state intervention, market and voluntarism already exist and so there are wider policy frames upon which to draw. When the Sydney water crisis emerged in 1998, choices in relation to NSW water already involved strong elements of all three. First, all the departments agencies, councils and committees identified in the previous section were `creatures' of the NSW Parliament. They were created by the Parliament, given terms of reference, subject to its regulatory regimes and substantially funded by it. Water provision in liberal democracies such as Australia, New Zealand, the UK and Canada, typically depended on substantial state intervention and provision. Second, market-based instruments emerged in gradually in Australia from the early 1980s onwards (Sheil, 2000), although they became of widespread significance in the early to mid 1990s as part of the COAG Agreement on Water Resource Policy and the National Competition Policy which provided clear financial incentives for states to implement efficiency reforms. These included the introduction of (i) more market-based pricing in order to better reflect the true cost of water provision and (ii) tradeable water entitlements in order to achieve a more efficient allocation of water resources (Crase et al, 2000; Bennett, 2003). Added to this, market and quasi-market elements had been introduced in order to ensure more efficient and effective reporting. Sydney Water was subject to rate of return reporting, and aspects of catchment management involved private companies which were created (e.g. Sydney Water's commercial laboratory, Australian Water Technology) or engaged (e.g. the French company Lyonaisse des Eaux-Dumez SA which was the main partner in owning and operating the Prospect Plant) for this purpose. Third and finally, there was to a lesser degree, an element of voluntarism and community involvement (particularly individuals, land holders and environmental groups) via three Catchment Management Committees (McClellan, 1998c). Therefore, a range of ideological frames already existed for authoritative choices in relation to Sydney's water, and this helped create conditions with potential for policy fluidity and reform.

The response of the Carr Government involved the use of two particularly interventionist instruments i.e. the creation of the Sydney Catchment Authority (SCA), as well as Sydney Water being subject to the direction of the Operating License Minister. However, given that state intervention in water was in effect the `default' and was still the dominant frame for water policy instruments, this was not perhaps such a drastic step to take. Carr's reforms also relied on surrogate market mechanisms – maintaining rate of return reporting and the paying of dividends by Sydney Water, as well as introducing this regime for the newly created SCA. Given that the previous few years had already involved market-type mechanisms and instruments, then the groundwork had been laid for incremental reform. This increased the broad range of potential options and so assisted the arguments of reformers. Finally, community involvement also existed (albeit on a modest scale) but the lack of public trust in water supplies as a result of the handling of the contamination incidents provided the seeds for strong recommendations on the part of McClellan (1998e) that this be strengthened. As result, the NSW Government increased the numbers and resources of the catchment management committees, as well as reviewing the balance of their membership. By 2005 there were 41 catchment management committees. Landholders and users must make up at least 50% of the membership – the rest comprising environmental groups, local councils and state government.

It is often difficult and (sometimes foolhardy) to speculate what would have happened in the absence of certain conditions. Broadly speaking, however, it is difficult to avoid the conclusion that reform in the wake of the Sydney water crisis was helped by the fact that reform could be achieved by incremental adjustments to the range of policy instruments used i.e. a strengthening of long-standing interventionism, a fine tuning of a market-based approach, and an expansion of the fledgling area of voluntarism through community participation. In this regard, there seems to be quite strong support for the third hypothesis.

Hypothesis 4: Reform Frequency

The basis of this fourth and final hypothesis is that the greater the frequency in the reform of authoritative choices within a given policy sphere, the more conducive this is to reform after a crisis because `change' is part of recent discourse. Therefore, interests and institutional structures which might offer resistance are less established or entrenched. This logic seems to apply to the Sydney water crisis. It would be wrong to think that the replacement of the Sydney Water Board in 1995 by Sydney Water was the only recent legacy of reform. As Sheil (2000) documents, water in NSW was an industry that had undergone progressive changes since the mid to late 1970s when – in the context of the turmoil of the world economy – the Labor Government under Neville Wran began a process of cost cutting in the search for more efficient and effective public services. In 1982, the Hunter Water Board in NSW introduced commercial pricing. In 1987, the Sydney Water Board saw itself as a `diversified business-orientated public utility -- which has learnt its lessons from the private sector' (Sheil, 2000: 96). In 1991, it sought private sector investment to build, own and operate water four filtration plants – including Prospect. In 1995, Sydney Water was created – operating under commercial law. Other changes around this time include the establishing of a Healthy Rivers Commission and a Water Advisory Council, as well as water pricing reforms and a separation of the role of water operator, manager and regulator (Sheil, 2000; Smith, 2000). Behind many of these reforms were the COAG's Water Reform Framework, the Commonwealth's Productivity Commission and the National Competition policy – all of which produced strong pressures for efficiency gains in the water industry. Even in the few years immediately after the establishing of Sydney Water, reforms and `fine tuning' continued apace, particularly via NSW legislation in 1997. Reforms included the establishment of catchment management committees involving local stakeholders; pricing reforms through the Independent Pricing and Regulatory Tribunal of New South Wales (IPART); the creation of State Water (a commercial entity with the Department of Land & Water Conservation with responsibility for water delivery); a new State groundwater protection policy; and new guidelines on water sharing, environmental protection, and water management planning (New South Wales Department of Land & Water Conservation, 1998).

The point should be made that inheritance was certainly not the only facilitator of reform. Crucially, as stated by Ron Dyer, Minister for Public Works and Public Services on introducing the Sydney Water Catchment Management Bill into the NSW Parliament, reform of the intransigent and fragmented nature of water governance was possible only because of the contamination incident (NSW Hansard, Legislative Assembly, 1 Dec 1998: 10950). Nevertheless, water choices already had an element of inherent malleability about them because they were in a regular state of flux and this seemed to create conditions favourable for post-crisis reform. This is difficult to prove but not unreasonable to conclude. Overall, therefore, the Sydney water crisis seems to provide modest support for the fourth hypothesis.

6. Conclusion

In the field of public policy studies it is always difficult to establish clear causal connections and so we have to treat our exploration here as a Wildavskian `art' rather than a `science'. However, there does seem to be quite a strong basis for the suggestion that `policy configuration' helps shape post-crisis periods of contested learning and reform. This was borne out by the case study of Sydney Water. On the one hand, post-crisis reform capacities were minimised because NSW water policy choices did not stand alone. Notably, the authoritative choices of the Federal Government with their emphasis on promoting market mechanisms and efficiency gains, cascaded down to state level (through directives and financial incentives). This resulted not only in state level infrastructural efficiency drives, but also the fragmentation of water `choices' across a plethora of institutions. In effect, these reduced the capacity for NSW policy reform, despite a well-respected and thorough inquiry chaired by Peter McClellan QC. As a consequence, the Federal Government's neo-liberal, economic rationalist agenda suffered only the most marginal of setbacks. For key bodies such as Sydney Water and the new Sydney Catchment Authority, commercial and quasi-commercial pressures remain considerable, and water provision continues to be the product of complex authoritative choices residing in a multitude of institutions. On the other hand, aspects of pre-existing policy choices did help free up reform processes. The broad range of state, market and voluntary-based policy instruments which existed in the NSW water industry, made it fairly amenable to reform through a marginal shift in favour of state interventionism (especially the creation of the SCA and the enhancing of the powers of the Operating Licence Minster) and greater voluntary involvement on the part of communities and stakeholders. Also, the fact that NSW Water policy choices were in a constant state of flux, assisted reform processes and those who advocated reform.

To conclude: the central argument of this paper has been that the pre-existing structure of choices in a policy area, can both help and hinder reform (and its advocates) in the aftermath of a crisis. It does not claim to offer the only explanation for the contestation of `learning' in post-crisis situations. Rather, policy configuration should be seen as an important variable that should be factored into a more holistic analysis, involving other classic public policy perspectives which deal with power, institutional values, political self interest and so on.

Finally, it seems useful to suggest that if `policy configuration' is worthwhile of further exploration in relation to post-crisis periods, then other questions might usefully be asked to prompt further study.

- Are there other factors which could be added into the `configuration' of policies? For example, should we add in authoritative choices over resources and suggest that the greater the resources invested in a policy area, the more difficult it is to reform?

- Under what circumstances is `policy configuration' a central factor in explaining post-crisis learning and reform processes, and under what circumstances does it play a lesser role e.g. powerful interests being able to prompt change, with little regard for policy configuration factors which might inhibit reform?

- In a given country, to what extent are some policy areas less liable to produce post-crisis reforms as a consequence of existing policy configurations?

- Are some political systems less conducive to post-crisis reform than others because of (i) substantial overlap in authoritative choices (ii) a heavy reliance on a narrow range of policy instruments, and (iii) the existence of a low level of policy reform?

- To what extent, if any, is `policy configuration' a recipe for recurring crises i.e. crisis periods, followed by a lack of capacity to reform, hence generating further crisis and so on?

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