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Public policy that does the right thing rather than the wrong thing righter[1]

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Abstract

Motivated by the reprisal of 'wicked problems' in Australian public policy discourse we make the case for understanding climate change adaptation, water and river managing, and other complex, uncertain, natural resource issues as 'wicked problems'. This 'framing' of social planning dilemmas dates back 40 years yet public policy practitioners still do not seem well equipped in terms of understandings and practices to engage with these situations and to effect systemic improvements. Drawing on a decade of research in Europe we make the case for investing in ***social learning*** as an alternative governance mechanism and as a form of praxis for managing in 'wicked problem' situations. We outline our main research findings to explain how we understand and enact social learning. In doing so, we also draw on the Open University UK's 35 years of experience of teaching systems thinking and practice for managing 'wicked problems'. We conclude by opening up an invitational space to explore the commonalities and differences in research on social learning with that on deliberative practices and governance.

1. Scene setting

In 2007 in a forward to a paper on the public policy implications of wicked problems the Australian Public Service (APS) Commissioner said: '*Tackling wicked problems requires a broad recognition and understanding, including from governments and Ministers, that there are no quick fixes and simple solutions'* (see http://www.apsc.gov.au/publications07/wickedproblems.htm). As we have been teaching the concept of 'wicked problems' as part of our Open University (OU) courses

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[1] This paper is based on a presentation made by RLI at the National Water Commission, Canberra on 23rd September 2008.

since the mid-1970s it was intriguing to us to see that the concept was being reprised (or introduced for the first time?). In the political context in which it was written the language was challenging and justifiably provocative.

In what we regard as an excellent paper the APS authors say that '*critically, tackling wicked problems also calls for high levels of systems thinking…. thinking* [that] *helps policy makers to make the connections between the multiple causes and interdependencies of wicked problems that are necessary in order to avoid a narrow approach and the artificial taming of wicked problems. Agencies need to look for ways of developing or obtaining this range of skills*'.

Given our experience and context these claims resonated with us. Perhaps not surprisingly, but disappointingly, upon his return to Australia, RLI[2] had found few openings, or conversational spaces, in which to introduce our European research experiences relating to water governance, social learning and systemic praxis. However, he soon found that the APS paper could open up conversational spaces that European experiences could not. Thus the APS paper became a mediating object in the sense explicated by Steyeart et al (2007).

In setting the scene we want to make it clear that from a European perspective we would not have chosen to start the conversation with the concept of 'wicked problems'. But we have learned over the years of the need to start the conversation where people are at and to employ devices which can open-up and mediate on-going conversations (Russell & Ison 2004). We have also found the need to reprise our own understandings of the origins of the 'wicked problem' neologism to be a fruitful line of inquiry. It serves well to situate our research on social learning.

2. Reprising 'wicked problems'

Table 1 lists some of the features of wicked and tame problems as elucidated by Rittel and Webber of the University of Berkley in a 1969 presentation and subsequently published in 1973. In the APS paper the authors cite climate change, obesity, indigenous disadvantage and land degradation as examples of 'wicked problems'. From our perspective they might well have added water catchment managing. Russ Ackoff (1974a,b) coined the terms 'mess' and 'difficulty' at much the same time as Rittel and Webber and suggested that managing a situation as a difficulty, or tame problem, when it was better understood as a mess, or wicked problem was an example of doing the wrong thing righter. Rittel and Webber also said: '*it becomes morally objectionable for the planner to treat a wicked problem as though it were a tame one, or to tame a wicked problem prematurely, or to refuse to recognize the inherent wickedness of social problems.*' Donald Schön (1995), another systems thinker, also recognized the complexity of open social problems associated with planning – this led him to refer to the 'swamp of real life issues' which he compared with the 'high ground of technical rationality'.

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[2] Ray Ison

Table 1. Some features of 'wicked' and 'tame' problems following Rittel & Webber (1973)

'Wicked problems'	'Tame problems'
There is no definitive formulation of a wicked problem.	have a relatively well-defined and stable problem statement.
Wicked problems have no stopping rule.	have a definite stopping point, i.e. we know when the solution or a solution is reached.
Solutions to wicked problems are not true-or-false, but better or worse.	have a solution which can be objectively evaluated as being right or wrong.
There is no immediate and no ultimate test of a solution to a wicked problem.	belong to a class of similar problems which can be solved in a similar manner.
Every wicked problem is essentially unique.	have solutions which can be tried and abandoned
Every wicked problem can be considered to be a symptom of another problem.	have a relatively well-defined and stable problem statement.

Our paper is an invitation to think about the nature of situations confronting public policy makers and practitioners, what happens when one reifies particular experiences in the form of neologisms and to take a double look at the thinking that informs public policy practice i.e. not only the thinking but the thinking about thinking that does or does not occur (Ison 2008a). It was his experience in organizational and planning contexts that led Russell Ackoff to observe how easy it is to become trapped in doing the wrong thing righter rather than doing the right thing, even if not so well. This trap arises when little attention is given to how our ways of thinking frame particular situations and when our practices do not encourage moving between levels of abstraction – as for example the difference between thinking and thinking about thinking.

Because our recent experience has been mainly concerned with water/river policy and practice – an arena where there is a commonly accepted 'global crisis' - the question we pose is: Is water catchment managing (and other multi-stakeholder natural resource managing situations) leading to systemic failure because of the way it is framed in policy and practice? We will argue that such situations are better framed as wicked problem situations and that policies and practices based on social learning have a role to play in 'managing' wicked problem situations. We explicitly distinguish managing from management to emphasize the praxis elements of the former (Collins & Ison 2007).

Appreciation of these experiences of Rittel, Webber, Ackoff and Shön have waxed and waned but it is fair to say that their ideas and the concept of wicked problems has not featured strongly in public policy practice. We feel sure most people have encountered situations where it would be appropriate to frame the situation as a 'wicked problem' – this has certainly been the case with our mature age OU students. A search for 'wicked problems' on Google gives 13,600,000 hits so it is clear that the concept has circulated in public discourse. But what also seems clear is that for whatever reasons: (i) most public policy practitioners are unable or unwilling to frame the many complex policy issues in terms of 'wicked problems'; (ii) there is little capacity for managing these 'wicked problem situations' systemically and (iii) the institutional settings and arrangements are not conducive to ongoing effective praxis in these situations.

If anything the circumstances experienced by these planners and scholars have been exacerbated by the growing anthropogenic impact on all environmental situations. This has given rise to the concept of *resource dilemmas*, especially amongst those who now accept that Hardin's original framing of the tragedy of the commons was simplistic and, through its uptake, has had serious negative consequences (see Arvanitakis, 2007; Ison et al 2007a).

Resource dilemmas have specific characteristics (Ison et al 2007a). Subtractability causes them to be marked by conflict and controversy or 'competing claims' and inter-dependence, in the sense that achieving one's objectives is predicated upon others reaching theirs. It can be difficult for stakeholders in a resource dilemma to accept such inter-dependence and its consequences. Resource dilemmas are further marked by the multiple perspectives held by the different stakeholder groups, each with their own optimisation strategies, theories and life worlds.

Resource dilemmas do not lend themselves easily to scientific analysis and solutions. In fact, they are complex in that a great many factors, biophysical, social, economic and political, interact in processes that are only partially path-dependent and usually unpredictable. Their outcomes depend on socially constructed realities and human reasons which make them highly uncertain. But that uncertainty is also inherent in the anthropogenic ecological imperatives that humans have engendered.

We suggest that 'resource dilemmas' can be seen as part of a lineage of understanding situations in ways that led Rittel and Webber to coin the terms wicked and tame problems. What is being challenged here is the way in which policies and practices are framed in mainstream practice. Take for example these two different ways of framing an environmental problem:

(i)   'those instances in which people's behaviour affects their physical environment in such a way as to place their own health, other people's health, the built environment or natural systems in jeopardy' (Glasbergen and Cörvers 1995).

(ii)   'environmental problems are not problems of our surroundings, but – in their origins and through their consequences – are thoroughly social problems, problems of people, their history, their living conditions, their relation to the world and reality, their social, cultural and living conditions - At the end of the twentieth century nature is society and society is also nature' (Beck 1992).

The first is the traditional approach whereas the second recognises that at this time in our history it makes sense to see all environmental issues as social in origin and resolution.

In the 1960s Rittel and Webber recognised what constrained the move between these two framings or, in their terms, between treating situations as tame rather than wicked. They argued that the difficulties attached to rationality are tenacious, and that '*we have so far been unable to get untangled from their web. This is partly because the classical paradigm of science and engineering--the paradigm that has underlain modern*

professionalism--is not applicable to the problems of open societal systems.' This claim still seems valid especially in Australia where the perspective of environmental issues as being social in origin does not yet seem well developed, thus suggesting new ways of thinking and practice will be required.

3. Social learning and systems practice

We now turn to the understandings and practices needed for engaging with wicked problems or 'natural resource dilemmas'.

3.1 Social learning

The empirical evidence for our claims about social learning arise from a 30 researcher, five country EU funded Framework 5 research project with the acronym of SLIM which ran from 2000-2004. Further evidence comes from a series of research contracts we have had with the Environment Agency of England & Wales associated with the introduction and implementation of the European Water Framework Directive and especially what the EA referred to as river basin planning (RBP).

Our SLIM research was carried out in England, Wales, Scotland, France, Italy the Netherlands and in the policy environment of the various EU offices and departments in Brussels. We have produced a significant number of research outputs including a special edition of the journal Environmental Science & Policy (Blackmore et al 2007). In this paper we offer some highlights in line with our concern for more effectively engaging with and managing 'wicked problems'.

Conceptually SLIM's main focus of interest was in understanding the application of social learning as a conceptual framework, an operational principle, a policy instrument and a process of systemic change. A premise of SLIM was that it is very useful to view sustainability as an emergent property of stakeholder interaction, and not a technical property of the ecosystem, a framing consistent with that of Beck's as outlined earlier. Ison et al (2007a) outline how social learning differs from traditional policy instruments or governance mechanisms. Blackmore (2007) reviews the background to social learning for the perspective of the many theories of learning. We argue that social learning when understood as an instrument or mechanism is something that can be invested in as an alternative and complementary approach to the traditional mechanisms and that to do so makes sense in wicked problem situations.

Margot Wallström when she was EU Environment Commissioner canvassed what policy makers traditionally regard as the main governance mechanisms, namely legislation and penalties, or regulation, grants for improvements and innovations, research and information. In the context of the 6th Framework she said (2003):

"The 6th Environment Action Programme promotes environmental development using all instruments available: legislation and penalties, grants for improvements and innovations, research and information."

Figure 1 makes a similar point in a slightly different manner - with regulation, market mechanisms or information provision, including education being utilised in response to the belief that environmental problems are knowable and thus fixed in time and space. The implication of this understanding is that we can all agree as to what will constitute an improvement, or solution i.e., there is a fixed or known form of knowledge that is applicable and this can be incorporated into regulations, education provision or new institutional arrangements.
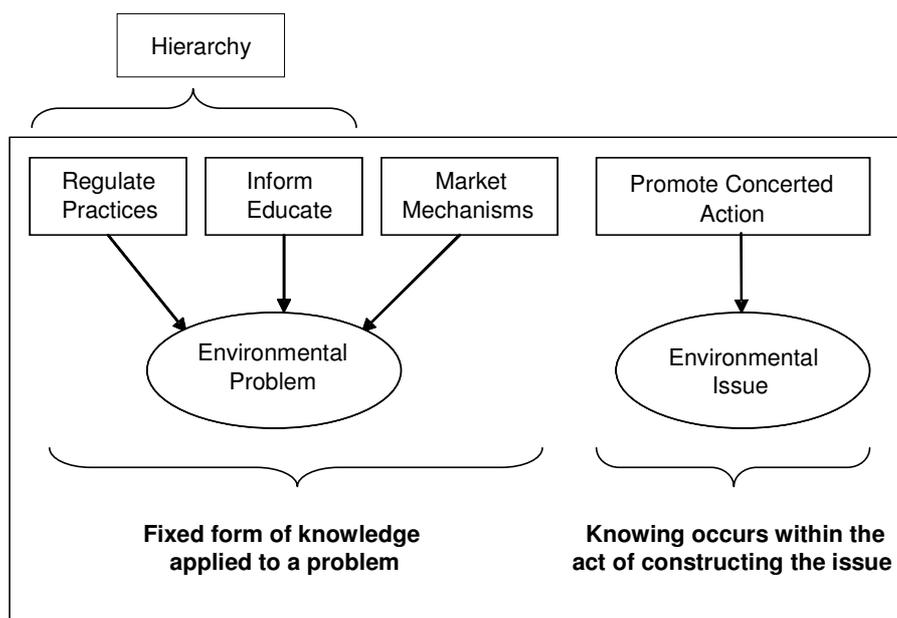

Figure 1.   Policy coordination mechanisms compared (i) within the current paradigm of environmental management comprising hierarchy and the market used to address pre-determined environmental problems based on a fixed form of knowledge and (ii) social learning for concerted action based on the process of knowing (Source: Ison et al 2007a).

Social learning on the other hand acknowledges the features of 'wicked problems, - that the nature of the problem and what would constitute an improvement are not knowable in advance of the process of knowing that occurs through the act of stakeholders constructing what is at issue.   This approach is consistent with Beck's framing of 'environmental problems as not problems of our surroundings, but – in their origins and through their consequences – as thoroughly social problems' outlined earlier.   These two distinct understandings give rise to the possibility of developing and using governance mechanisms with differing adaptive potential in policies.   In our view, it is important to stress that these need not be antagonistic: used creatively and with awareness they can by complementary.

We have found the metaphor of the orchestra to help explain what we mean by social learning.   An orchestra can be seen as an entity that can be invested in just as social

learning as a policy instrument can be invested in. But it is not the orchestra per se that one is really investing in – it is the prospect of one or more good performances in a complex arena that involves the interaction of many players, with different histories and instruments and for each performance a different audience. So with social learning just like an orchestra we can refer to both an entity and processes (Figures 2 and 3).

Marked evidence of success in the purposeful investment in social learning as both entity and process comes from the Netherlands in a case study called 'water conservation in the Benelux middle area' (Jiggins 2004; Jiggins & Röling 2004; Jiggins et al 2007). In this project what investors considered a successful performance was achieved at scale and across jurisdictional boundaries. We not have space to describe this case study in full. In the first phase this project involved 11 partner organisations, over 3500 farmers and covered 140,000 ha of irrigated sandy soils. What was at issue was the over exploitation of groundwater and the need for more conservative and efficient water use. Investment in social learning was actively pursued by the provincial government because they had learned that regulation with associated monitoring, attempts to enforce compliance and prosecution, were expensive and did not work. Both phases of this project delivered significant water savings. In Phase 2 capacity to conserve an additional 4 million m^3 water per year (independent of rainfall) was achieved through measures such as permanent physical changes (e.g. raising bottoms of ditches; closure of deep wells); and flexible measures such as installation and management of on-farm weirs. We say more about these weirs below.
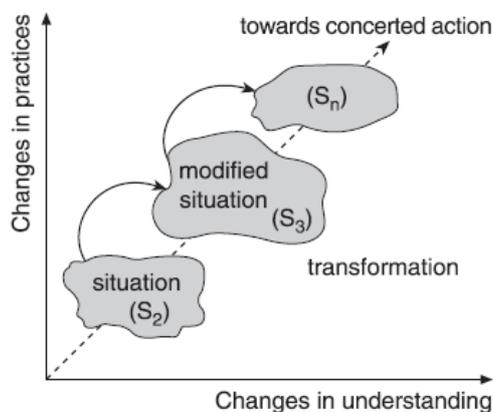

Figure 2. A heuristic for exploring the dynamic of transformational change, understood as changes in practices with changes in understanding, in complex and uncertain natural resources managing situations (S) such as integrated catchment management (S1-S3, situation one, two or three etc) (Source: SLIM 2004).

We now turn to social learning as a process. Social learning as a process and emergent outcome can be understood as the transformation of 'wicked problem' situations (Figure 2) through changes in understandings and practices (where neither is prime) of those involved (Steyaert & Jiggins 2007). We wish to give you a feel for how this transformation works drawing on what we call the SLIM heuristic (SLIM 2004). This

heuristic is built on empirical research which shows a set of factors or variables that can enhance or constrain social learning (Figure 3).
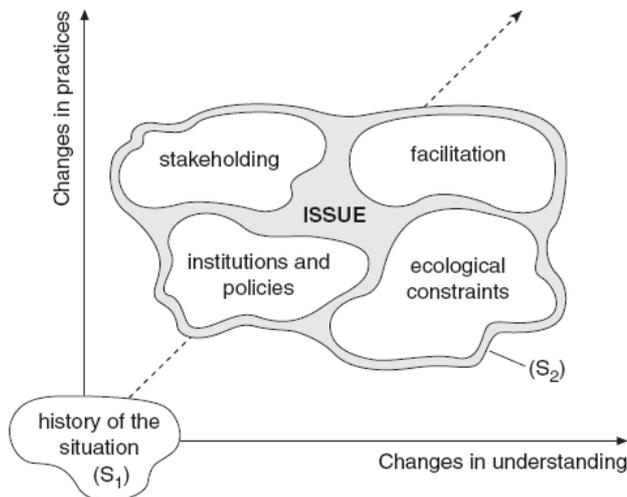

Figure 3. The SLIM heuristic which demonstrates the variables found to constrain or enhance the transformation of 'wicked problem situations' associated with water and catchment managing (Source: SLIM 2004).

The first two of the variables that can enhance of constrain this transformation process are firstly the history of the situation and secondly institutions including policies. History matters because it:
*   determines initial starting conditions for any activity
*   establishes certain constraints and possibilities
*   includes the history of our thinking about the situation, and the thinking that has been incorporated into institutional arrangements when they were developed.

For example, imagine the view looking south near Burramine, of the NSW-Victoria border which follows the southern bank of the Murray River. This view would illustrate the variables 'history of the situation' and 'institutional arrangements'. The landscape has been determined by the historical decisions of surveyors (true north in Victoria and magnetic north in NSW, also different subdivision and grid dimensions) and these decisions have become institutionalised in ways that create different practices, understandings and landscapes in each state. The impacts of this process can be seen by looking at how much forest is left along the southern bank of the river compared to the northern bank i.e., NSW and Victoria have institutionalised different 'rules' about clearing along the river bank.

In our understanding of institutions we are influenced by new institutional economics. We recognise that institutions can be policies and objectives, laws, rules, regulations, organisations, policy mechanisms; and norms, traditions, practices and customs and

that institutions are everywhere and influence how we think and what we do. We have also come to see that in water managing the systemic impacts of adding new institutional arrangements to a situation are often poorly understood. We have come to recognize that the institutional constraints variable is the most powerful in effecting the transformation of complex situations and argue that the systemic complexity of institutional arrangements needs to be better understood and managed. Consider these two examples.

Anyone who has been inland from Ancona in the Marche region of eastern Italy would undoubtedly be impressed by the rural landscape mosaic. If one were there as a tourist it would be very easy to admire the scenery without recognising that the principle determinant of this landscape and the farming systems that create it is the Common Agricultural Policy. A visitor would probably also not realise, because it is hidden, that the farming systems have created groundwater with levels of nitrates that now make it unsafe to drink and that the cropping system and associated cultivation methods leads to high levels of soil erosion. Even less apparent would be the almost complete inability of the organizations involved, including farmers, to act purposefully to improve the situation.

How the interaction of historical understandings and institutional arrangements can potentially lead to unintended consequences can be exemplified in the Australian water managing context in research led by Lee Godden, Professor of Environmental Law in the Melbourne Law School. We now know that in many parts of the world there have been unintended consequences from policies built on Hardin's 'tragedy of the commons'. In policies based on Hardin's conception the classic response has been to introduce private property to address 'tragedy of the commons' issues. But the situation is more complex as exemplified in Australia where existing inequalities in entitlements and over-allocation exist in what is already a highly regulated sector with institutional inertia in many instances. So the situation is not just open access or common pool. Water trading – introduced through the CoAG/National Water Initiative (NWI) reforms is premised upon introduction of property rights and separation of land/ water, with a cap and trade mechanism.

CoAG's espoused twin goals are firstly efficiencies in use and addressing environmental problems including over-allocation and secondly creation of a market i.e. water trading is supposedly designed to address twin goals of efficient use and environmental restoration. Lee argues that there has been a shift in orientation in the NWI and that this leads to confused objectives. Rather than the market being the means it is now the ends. In other words the focus has shifted to the facilitation of the market per se, as in the NWI 'deepening of the market' and the market rules in the National Water Act 2007.

She argues that advocacy for property rights in water is premised on a narrow, non-systemic view, based on certainty for consumptive users and that this is not strictly necessary in a legal sense for the operation of cap and trade policy but is related to 'traditional wisdom' on common pool resources. The result is that when the legal regime of property is added e.g. government intervention/compensation, the institutional complexity means that responsiveness to change can only occur in individual

'uncoordinated' manners. The 'invisible hand of the market' can only be aggregate not collective. This places restraints on adaptive management (and social learning), especially in a climate change era. Expressed in our language these arrangements may constrain collective action or social learning and may exacerbate rather than improving wicked problem situations. We thus need to better understand what institutional complexity can cook up!

The other three variables are stakeholding, facilitation, and ecological constraints[3]. These are described in some detail in SLIM 2004). Building stakeholding is an active process – it is more than traditional stakeholder analysis. Facilitation may be by an individual or group but may also be achieved through the mean of a mediating object e.g. using scientific data (Italy), a weir (the Netherlands), a catchment plan (UK) or a breed of cow (France) as a mediating object (see Steyaert & Jiggins 2007; Collins et al, 2007). How we understand the ecological constrains variable is exemplified by the debate in Australia over the fate of the Koorong and other lakes on the lower Murray. It is concerned with how and whose knowledge constructs what is at stake.

In summary we understand social learning as one or all of the following:
  i. The convergence of goals, criteria and knowledge leading to more accurate mutual expectations and the building of relational capital. If social learning is at work, then convergence and relational capital generate agreement on concerted action for integrated catchment management and the sustainable use of water. Social learning may thus result in sustainable resource use.
  ii. The process of co-creation of knowledge, which provides insight into the causes of, and the means required to transform, a situation. Social learning is thus an integral part of the make-up of concerted action.
  iii. The change of behaviours and actions resulting from understanding something through action ('knowing') and leading to concerted action. Social learning is thus an emergent property of the process to transform a situation.
  iv. The title for a governance mechanism which policy makers can employ (Figure 1).

3.2 Systems practice

Starting off systemically to attempt to change or improve situations of complexity and uncertainty means being both systemic and systematic - these are the two adjectives that arise from the word 'system'. The word system comes from the Greek verb *synhistanai*, meaning 'to stand together' (the word 'epistemology' has the same root). A system is a perceived whole whose elements 'hang together' in some way (a better term is perhaps "interconnected"). Someone who pays particular attention to the interconnections is said to be systemic (a systemic family therapist is someone who considers the interconnections amongst the whole family; the emerging discipline of Earth Systems Science is concerned with the interconnections between the geological and biological features of the Earth). On the other hand, someone who follows a recipe in a step-by step

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[3] A set of Policy Briefings can be downloaded from the web. These refer to each of the 'SLIM variables' as well as Learning Processes and Capacity Building – see http://slim.open.ac.uk

manner is being systematic. Medical students in courses on anatomy often take a systematic approach to their study of the human body – the hand, leg, internal organs etc – but at the end of their study they may have very little understanding of the human body as a whole because the whole is different to the sum of the parts, i.e. the whole has emergent properties.

Many, but not all, people have some form of systemic awareness, even though they may be unaware of the history of 'systems thinking and practice' as a particular field of practical and academic concern (Figure 4; Ison 2008b). Systemic awareness comes from understanding:

i. 'cycles', such as the cycle between life and death, various nutrient cycles and the water cycle – the connections between rainfall, plant growth, evaporation, flooding, run-off, percolation etc. Through this sort of systemic logic water availability for plant growth can ultimately be linked to the milk production of grazing animals and such things as profit and other human motivations. Sometimes an awareness of connectivity is described in the language of chains, as in 'the food chain' and sometimes as networks, as in the 'web of life'. Other phrases include 'joined up', 'linked', 'holistic', 'whole systems', 'complex adaptive systems' etc;

ii. counterintuitive effects, such as realising that floods can represent times when you need to be even more careful about conserving water, as exemplified by the shortages of drinking water in the New Orleans floods that followed hurricane Katrina in 2005, and

iii. unintended consequences. Unintended consequences are not always knowable in advance but thinking about things systemically can often minimise them. They may arise because feedback processes (i.e. positive and negative feedback) are not appreciated. For example the designers of England's motorways did not plan for what is now experienced on a daily basis – congestion, traffic jams, emissions etc. These unintended consequences are a result of the gaps in thinking that went into designing and building new motorways as part of a broader 'transport system'.

At the Open University the Systems group has over the last 35 years developed courses designed to equip students with systems thinking and practice skills. These courses have drawn on almost the full range of System understandings that are depicted in Figure 4. Space does not allow a full consideration of all that is encompassed in our Open University work but it is worth emphasising that the intellectual territory our courses cover are not well appreciated in academia and in policy circles in general.

Elsewhere (Ison 2002; Schlindwein and Ison, 2005; Collins et al 2007) we argue that the primary need for effective systems practice is epistemological awareness (for this reason we sometimes replace the 'ecological constraints' variable in Figure 3 with 'epistemological constraints'). When Checkland and his co-workers, beginning in the late 1960s reacted against the thinking then prevalent in systems engineering and operations research (OR), and coined the terms 'hard' and 'soft' systems (Table 2) the

case within 'systems scholarship, for epistemological awareness began to be made apparent.
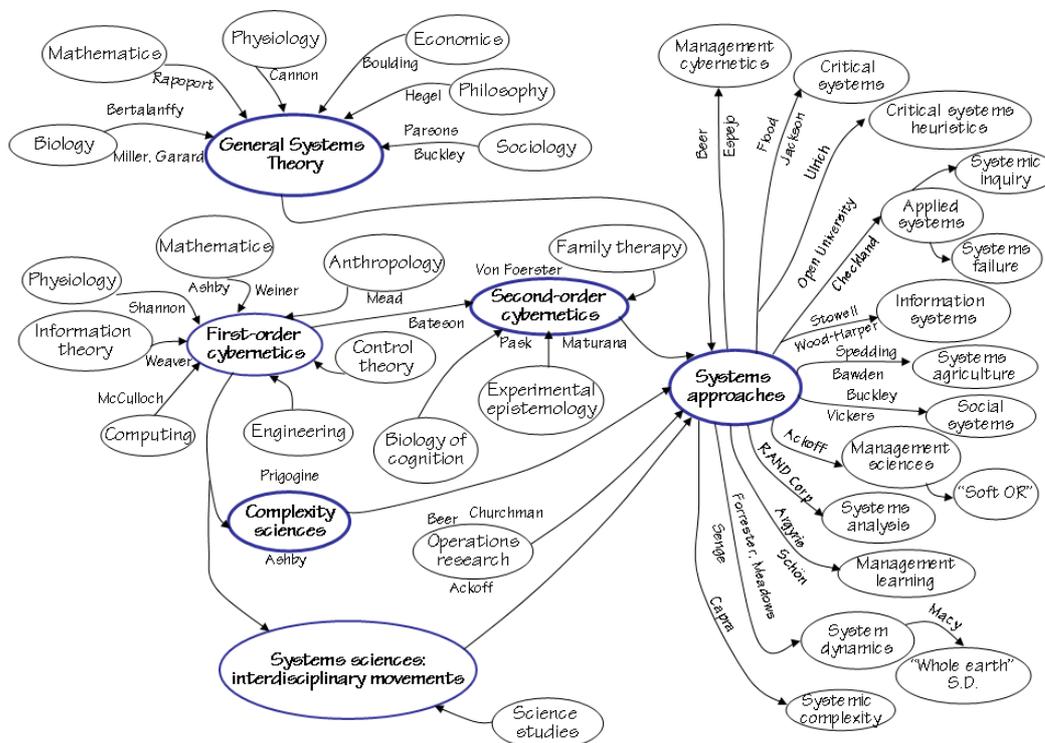

Figure 4. A model of different influences that have shaped contemporary systems approaches (Source: Ison 2008b).

Table 2. The 'hard' and 'soft' traditions of systems thinking compared (Source: adapted from Checkland, 1985)

The hard systems thinking tradition	The soft systems thinking tradition
oriented to goal seeking	oriented to learning
assumes the world contains systems that can be engineered	assumes the world is problematical but can be explored by using system models
assumes system models to be models of the world (ontologies)	assumes system models to be intellectual constructs (epistemologies)
talks the language of 'problem' and 'solutions'	talks the language of 'issues' and 'accommodations'
Advantages	**Advantages**
allows the use of powerful techniques	is available to all stakeholders including professional practitioners; keep in touch with the human content of problem situations
Disadvantages	**Disadvantages**
may lose touch with aspects beyond the logic of the problem situation	does not produce the final answers
	accepts that inquiry is never-ending

Systems practitioners, such as Checkland, found the thinking associated with goal-oriented behaviour to be unhelpful when dealing with 'messes' or 'wicked problems'. This resulted in a move away from goal-oriented thinking towards thinking in terms of learning – sometimes described as a move away from positivism to interpretivism (Flood 1999; Jackson 2000).

Our recent work demonstrates the role systems praxis plays in effecting transformations in complex situations as depicted in Figure 2 (see Collins et al 2005; 2007; Collins and Ison 2006). In this work we employ our systems praxis to effect social learning through the purposeful design of learning systems (Ison et al 2007b). We find this effective in responding to the transformation needs identified in Shön and Rein's (1994) argument that policy positions rest on underlying structures of belief, perception and appreciation which they call 'frames'.

Drawing on our systems tradition leads us to use the SLIM heuristic systemically in a number of ways: (i) as a basis for design of co-research with others to help structure inquiry; (ii) as mediating device, or epistemological device for facilitation; and (iii) as an analytical tool to make sense of the situation and gain insight into purposeful interventions to bring about desired changes.

However, we do not wish to convey the impression that using systems approaches for social learning are easy options or can be pre-planned in great detail and 'worked through' step by step to a predetermined goal. This would be counter to our conceptual and practitioner commitment to trusting emergence. Nonetheless, our experience of using these approaches in institutional and organizational settings suggests that formalised support (often in the form of an individual champion) for keeping open spaces for deliberation, inquiry and emergence is fundamental to their initiation and continuation.

4. Conclusions and invitation

In this paper we have explored some of the key framings of social planning dilemmas through the lens of 'wicked problems'. This is timely for Australian public policy discourse operating in the context of climate change adaptation, water and river managing, and other complex, uncertain, natural resource issues. Although these kinds of 'wicked problems' have been described almost 40 years ago, public policy practitioners still do not seem well equipped in terms of understandings and practices to engage with these situations and to effect systemic improvements. There is also a lack of 'joining-up' of intellectual discourses and conceptions of situations. For example, attempts to handle resource dilemmas more effectively are to be found in the focus on more deliberative and inclusionary forms of environmental decision-making (Blackmore & Morris 2001; Ison et al 2007b). This also stems from a long lineage of concern around deliberative democracy (see for example Dryzek, 2000; Fishkin and Laslett, 2003) as a means to improve the quality of decision-making and policy.

In an environmental context, Bloomfield et al (2001) provide a useful overview of some of the key questions and challenges which surface when institutional recognition is accorded to diverse sets of stakeholders with diverse views. This body of work on the 'deliberative turn' has extended into the entire gamut of environmental issues including nuclear waste, climate change adaptation; land use; and water management.

While many of these debates recognize the importance of engagement as part of a democratic imperative (leaving aside concerns over discourse domination by certain groups– see Bloomfield op cit); there seems often less discussion about the reasons why deliberation is required as a response to the changing nature of environmental issues. In other words, there is as yet limited recognition that the increasing complexity and 'wickedness' is part of the rationale for new forms of thinking and practice of which the deliberative turn is one example. In our work, we have focused on making clear the key characteristics of environmental issues which are important if we are to develop appropriate policy responses. However, this knowledge is, of itself, insufficient without a corresponding capability to engage with wicked problems (i.e., forms of praxis with capability). There is clearly scope and social need for engagement between these different communities of discourse and an imperative to develop robust forms of praxis.

Our work in the European context in the last decade has focused on alternative approaches to managing natural resources. We make the case for investing in *social learning* as a complementary governance mechanism and as a form of praxis for managing in 'wicked problem' situations. The SLIM heuristic, depicting the factors or variables that can enhance or constrain social learning, offers users a tool for description of situations and, more powerfully, a means for insight about the kinds of changes need in thinking and practice.

In effect, this suggests that the primary need for effective systems practice is epistemological awareness – a feature of systems approaches which began with Checkland's distinction between hard and soft systems. From this awareness stems insight into how policy positions frame our beliefs, perceptions and the extent to which wicked problems are truncated or actively explored in policy discourses. Our experiences suggests that systems praxis can, with appropriate forms of support, play an effective role in helping to transform complex situations through the purposeful design of learning systems. We contend that our approach responds to observations made by Rittel and Webber (1974) when they claimed that 'the systems-approach "of the first generation" is inadequate for dealing with wicked-problems. Approaches of the "second generation" should be based on a model of planning as an argumentative process in the course of which an image of the problem and of the solution emerges gradually among the participants, as a product of incessant judgment, subjected to critical argument'.

It is perhaps in giving permission to try alternative ways of thinking about current problems that investment in social learning can first find a footing in institutional structures. Although we draw attention to complexity and uncertainty as key characteristics which give clues as to the kinds of situations which could benefit from social learning approaches, without a sense of context, it is almost impossible for us to

suggest specific measures for the wide range of environmental situations. Instead, returning to our orchestra metaphor, we invite readers to consider the kinds of things they consider worthy of investment in an orchestra to enrich its overall performance.

Based on the above, we, collectively, face a difficult question: is concerted action constrained in Australia's water managing by a failure to treat it as a wicked problem? And, by extension, are we over committed or trapped into doing the wrong thing righter? Based on recent experiences in Australia with the collapse of the Murray-Darling river basin system (in an ecological and governance sense), we would have to say that there is considerable evidence of doing the wrong thing righter. Despite being lauded as a world leader in catchment management planning, Australia's very recent experiences suggest something fundamental has gone awry with its water managing governance systems in their failure to anticipate or adapt to shifts in climate patterns. The complexity and 'wickedness' of the situation has become all too apparent.

So how could we proceed if we acknowledged water management situations as 'wicked problems'? Here are some suggestions for further research and action. We recognize and, based on our own research experience in a European and African context, know that our suggestions are not without difficulties or potential for significant upheaval in how we think and how we act. However, investing in social learning as a means to engage with wicked problems or situations requires enacting some of the following in context-sensitive ways:

- Abandon certainty - develop research and practice capability to understand the complexity we are trying to manage;
- Treat water managing as a 'wicked problem';
- Invest in 'social learning' in policies whilst building and supporting capability to enact it;
- Explore ways to understand and reduce institutional complexity;
- Think and act in relation to water holistically – or be faced with unintended consequences, including 'dead rivers' and/or areas devoid of viable livelihoods.

It is perhaps the last suggestion which serves as the starting position from which to progress towards 'doing the right thing wronger'. In essence, it places emphasis on the ability for individuals and organizations to iterate between systematic *and* systemic perspectives of the situation and to develop appropriate actions based on insights from the interplay of engaging with detail and holism. This is the mark and territory of systems thinking and praxis. We suggest it is systems praxis, the theory informed action, that is needed to deal with wicked problems and to enact social learning. Sadly there are few places in Australia where 'systems' is taught. As 'wicked' problems become increasingly prominent in policy discourses, however, we would hope to see an increased recognition of the current situation and a desire for a new set of skills and competencies in public policy. This would at least be the start of doing something 'righter'.

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