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You Never Miss the Water till the Well Runs Dry: Crisis and Creativity in California

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Water resource management in California is a complicated business. The San Francisco Bay Delta in northern California supports the state's largest habitat for fish and wildlife and provides a nursery and migration corridor for two-thirds of the state's salmon. It also contains Suisun Marsh, the largest contiguous salt-water marsh in the United States. The systems that were built to serve California's increasing population – dams, canals, pipelines, and so on – attempt to regularize and borrow water from these natural systems.[1] Indeed, two-thirds of California's residents, the majority of whom are in southern California – some 600 miles away – receive some or all of their drinking water from the San Francisco Bay Delta, and its waters irrigate over 200 types of crops which, between them, produce 45 per cent of the United States' fruits and vegetables. Huge quantities of water are also moved (by federal, not state, projects) across the desert from the Colorado River. In addition to all these transfers, water that originates in the Owens Valley comes east through the mountains to Los Angeles, and some of southern California's water comes northwards from Mexico.

The complexity of these natural and built systems is exacerbated by institutional fragmentation and specialization. Historically, water policy has been dominated by large-scale bureaucracies that have built evermore infrastructure as a response to the natural variability and uncertainty of water supply. The relative conservatism of these water agencies, as many social scientists have observed,[2] comports with their strong commitment to reliability of service and their low public visibility. 'Predict and provide' has long been the motto of their successful strategy, and their claims that only experts can understand and make rational decisions for highly complex water issues have gone largely unchallenged. Until recently!

The trouble is that predicting and providing (along with the risk-spreading tactics, standard operating procedures and criticism-deflecting quantitative decision-aids that this strategy gives rise to) works only for as long as those

who are doing the predicting can come up with the provision:

- *Inability to meet growing demand.* The enormous growth of Los Angeles, San Diego and Orange Counties has occurred in an area of very low and highly variable rainfall, and it is only the massive and long-distance transfer of water that we have outlined above that has made this growth possible. The alternative – limiting growth in line with the availability of water – has not been entertained, and yet that, it would seem, is what is now happening. On 31 May 2002, a Supreme Court judge in the state of California called a temporary halt to the development of the largest housing project in Los Angeles County's history. The judge ruled that the developers of the 22,000-home Newhall Ranch had not proved that they could supply enough water, especially during periods of drought.
- *Inability to meet new, non-human demands.* New values – the protection of the environment in general and of endangered species in particular – once translated into law can dramatically reduce the availability of water at the very moment when the agency is striving to provide for the increased human demand it has predicted. These new values, moreover, often conflict directly with the traditional values and practices of the established agencies. As these novel demands have multiplied – water for fisheries, water for birds, water for hydropower, water for recreation as well as for more familiar recipients: agriculture, municipalities and industry – new agencies have been established to serve these ever-proliferating constituencies. Each agency, in consequence, has a relatively narrow jurisdiction, with mandates that encompass only a subset of the full range of relevant water objectives and uses. Making progress towards one agency's mission, not surprisingly, often involves negative impacts on other agencies. Economists would characterize this as the 'externalization' of the originating agency's problems. And, as the agencies multiply, so do the externalities!

The first line of response, among the agencies, has been to consolidate control over the resources required to meet their specific organizational missions. At first, this meant over-building the retention and delivery systems, so as to ensure that quantity and quality of water was available to all users at all times. Protection for additional water uses (e.g., fish and wildlife, recreation) also took this path, with a host of engineered solutions such as fish ladders, hatcheries and wildlife reserves. This orthodox response – consolidation of resources together with the provision of redundant ('belts-and-braces') infrastructure – has, until recently, buffered many organizations from the effects of growing scarcity and the accompanying threats to quality. However, these overbuilt systems (along with policy and administrative arrangements) have reduced flexibility: there is now much less scope for responding to new demands.[3] As water systems expand in terms of

infrastructure, number of participating agencies and geographic spread, so the potential for over-subscription of the resource also increases. In many instances, water policy makers have come to gridlock: 'predict and frown', at is sometimes unkindly called. But in some instances – and these are the ones we will be looking at – this has not happened.

Coordination and conflict

In response to growing demands on the state's water resources, various players have been invited into alliances that bring diverse expertise and authority to the problems of securing sustainable water supplies, maintaining environmental quality, and ensuring access to recreational facilities. The early stages of these strategies look like nothing more than coordination among organizations that are responsible for managing different aspects of the system. Water supply agencies, for example, look for partners that are responsible for managing species and habitat protection. Or, they begin working with agencies at different scales of governance (e.g., federal and state agencies complementing local governments and the involvement of non-governmental organizations). New cross-sector networks and alliances are thus formed so as to address the complexity of managing water resources, but also to gain new, risk-bearing partners. So it is more than just coordination, because new parties are drawn in to share the agencies' responsibility for finding acceptable solutions.

It is not as if there is a dearth of solutions for water resources issues. Engineers know how to build dams and water transfer systems. They are experts in water treatment and quality control. Working with biologists, they are even learning how to restore fish and wildlife habitats. Lawyers have the means to perfect property rights and can create new definitions of public welfare statutes and public trust to constrain publicly undesirable water uses. As one of our respondents told us, 'if all other sources of water fails, there is plenty of water in the Pacific Ocean that can be desalinated'. The problem is finding agreement on a solution that is acceptable to the adherents of the different ways of organizing, perceiving and justifying, all of which are represented by among the various organizations and stakeholders that are now inextricably intertwined in managing California's water resources. The limitations of any water resource strategy prescribed by a single way of organizing are clear, once they are compared with the critiques offered by the other two. Each has a unique, but partial, view of the problems and potential solutions. While it is possible, from the hermit-like perspective of the disinterested scholar, to see that all three have something vital to offer the process, each of the ways of organizing, perceiving and justifying comes with its own diagnosis and solution. And since each diagnosis-cum-solution defines itself in opposition to the others, compromise and cooperation are rendered especially difficult.

The *individualistic* way of organizing and perceiving closely parallels the well worked-through recommendations long espoused by water resource economists, particularly those who identify themselves as adherents of 'rational choice' theory.[4] Water, these advocates of individualism maintain, is a commodity like any other, and its value should be determined by supply and demand. Water shortage, therefore, is a consequence of a poorly performing market. If water were priced at its true value, there would be those willing to sell and others able to buy. The large-scale bureaucracies that characterize contemporary water management are a waste of public money; such agencies do little more than pursue their organizational interests at public expense. Individualistic solutions to California's water problems would include perfecting property rights so that everyone knows how much water they own, and providing price and availability information for water auctions.

In the hierarchical view, these proposals are unacceptable. This view insists that the complexity of hydrological and ecological systems require rational planning and management. Markets do not engage in comprehensive planning, and the pursuit of short-term economic gains leads, in the aggregate, to long-term ecological disaster. If time horizons for buyers and sellers extend no further than the next sale, infrastructure investment will be ignored or postponed. Ultimately, the public will have to pay for the neglect that is engendered by market-dominated systems. Egalitarian objections to the individualistic solutions are based on a pair of moral arguments: that market systems ignore the needs of the natural world, and that they increase inequities among citizens. The natural world is neither a buyer nor a seller, and under-funded environmental groups make poor surrogates for species and habitats. The value of water simply cannot be quantified in dollars and a resource that is essential to life has intrinsic value beyond price. Sufficient water to support life ought to be free and water wasters should be made to see the error of their ways.

The *egalitarian* perspective is espoused by the environmental and environmental justice movements. These groups believe that a more eco-centric approach to water management is critical. This would include limiting industrial and municipal growth to naturally available water supply, de-centralizing water decisions to local arenas, recognizing the rights of nature as equal to those of humans, the application of technology appropriate for conservation rather than for the production of new water sources, and adherence to a very strict interpretation of the 'precautionary principle'. Poor and indigenous people's rights to water must be respected at any cost. Egalitarian solutions to California water problems include water conservation by all users, discontinuation of inappropriate desert water uses (e.g., agriculture, golf courses), and zero tolerance for the profligate use of water.

In contrast to the egalitarian view, people and organizations tapping into an individualistic perspective see these recommendations as a recipe for

disaster. They put fish (and other elements of the environment) before the welfare of people, and they stifle the innovation that is so essential for progress. The egalitarian view, moreover, disregards the true cost of water, leading to inappropriate market signals. If there is truly insufficient water to support further growth in California then the price of water ought to be so high as to discourage the in-migration of people and industry. People and organizations espousing a hierarchical perspective fear that reducing water demand means the end of growth and prosperity that California has long enjoyed, and that has been the direct result of the water bureaucracies' far-sighted construction of facilities. Without their timely and carefully planned actions, the water that is vital for all this development would have been used upstream by other states or lost to Mexico. Orderly delivery of urban water supplies, they insist, requires rates that are sufficient to pay utility costs; and, encouraging conservation in an unplanned way may leave utilities short of funds. Local watershed management, they feel, is not a good idea since it leads to fragmentation and to heightened boundary conflicts. Moreover, small watersheds lack the resources to produce the research and development that are essential for effective water management.

Organizations adhering to *hierarchical* views look at past water management practices as more success than failure. The large-scale dams and diversions are not 'sunk costs', but infrastructure investments that continue to pay off. What others see as over-building, they see as providing the degree of redundancy that is needed to ensure the reliability of water supply under highly varied natural conditions. They note that the region has droughts that last as long as a decade, and that considerable reservoir storage is therefore vital. Hierarchical solutions to Californian water problems are characterized by investment in science to reduce uncertainty, inter-agency cooperation to facilitate the distribution of water across vast spaces and multiple organizations, and continued investment in advanced infrastructure to cope with natural vulnerability.

The egalitarian and individualistic viewpoints share a common critique of these hierarchical solutions, arguing that there is no evidence that additional investment in bureaucracy and infrastructure will solve California water problems. From both vantage points, it appears that additional infrastructure will only reinforce current wasteful water use practices and, at the same time, ensure that important participants will continue to have no voice in decision and management. Those buying into an individualistic rationale are concerned about taxpayers and ratepayers, while those adhering to egalitarian views and norms are concerned about nature and the disadvantaged. Both groups resent the elitism represented by privileged science and opaque bureaucracy.

Thus, it is easy to see that, as new partners are drawn into water resource management, they often insist on what appear to be incommensurable demands on existing programmes or organizational values. It may be difficult to satisfy emerging demands without challenging the assumptions and operations of the existing systems. New participants bring different needs, expectations and world views, challenging the authority of traditional expertize to solve problems. The level of conflict rises, threatening the very basis of the water industry's reputation: its ability to deliver high quality water at the right time and in the needed quantity.

Reaching the crisis point

Conventional strategies for serving Californians' water needs came to an abrupt end in 1982, when the voters decisively defeated a proposal for a peripheral canal which would move water around – rather than through – the Bay Delta. Residents in northern California opposed the loss of more of their water to the south. Environmentalists were not satisfied with the environmental protections afforded by the bill, while agricultural interests swung the other way, insisting that the deal included too many environmental restrictions. Doing nothing was not an option. Indeed, by the 1990s, federal and state courts and the Environmental Protection Agency were rejecting the state's water quality standards, thereby threatening the stability of municipal water supplies; farmers were being forced by the Central Valley Improvement Act (a piece of federal legislation) to allocate over 800,000 acre-feet of water to fish and wildlife restoration; and even more ominously, the Sacramento River winter-run salmon and the Delta smelt (newly-hatched salmon) were listed as endangered under the Endangered Species Act. Matters reached a head in June 1999 in what was widely referred to as the 'smeltdown'. Pumps sending Bay Delta water south to Los Angeles were shut down in order to save a three-inch, translucent minnow. To compound matters, the 1987–92 drought was one of the longest and severest in the state's history; by the third year of the drought, overall state-wide reservoir storage was about 40 per cent of average. The Metropolitan Water District informed its member agencies that it would not be able to supply water at historical levels. The impacts of all this on local communities differed depending on groundwater reserves. Some agencies that were without reserves had no alternatives but to seek ways of reducing demand. 'Predict and provide' had hit the buffers!

In southern California

In response to the drought, three southern Californian utilities – the Otay Water District, the City of San Juan Capistrano Water District, and the Irvine Ranch Water District – adopted a highly unusual conservation rate structure. Standard practice among public utilities is to use a cost-of-service structure, which simply means that the bill for all water users equals their total use of water times a base rate. The innovative rate structure used by the three

southern Californian utilities retains such a base rate, but in addition each water sector is allocated a conservation use target. Customers using more than the target are confronted with sharply escalating fees. For example, the residential target use is based on a combination of factors, including size of lot, housing characteristics and daily calculations of evapo-transpiration. Households that want to consume more than their target have to pay a significantly higher rate for their additional water needs. When this policy was first implemented as an emergency measure during the drought, some residential customers so far exceeded their target rate that they were billed as much as $300 a month over their conservation rate.

Recalculations of the base rate for the three utilities were made with input from many stakeholders, who agreed that the amounts of water they were expected to use and the resulting costs were fair. After the new charges were installed, water use actually declined. Most ratepayers never used their entire base water rate. The new water bills, which explained water use in detail, helped water customers to understand the consequences of profligacy and conservation.

Since first adopted over a decade ago, these rate structures have remained in force, and they continue to reinforce the conservation of water. One utility, for example, assesses penalties (for consumption above the conservation target) to only about two per cent of its customers. Work continues to refine the conservation rates to other sectors, including cooling towers and hospitals. Because the rate does not have much bite (i.e., people typically do not exceed the base rate) and is seen as being both science-based and fair, it is seldom challenged. Should serious drought require a further significant reduction in demand, the conservation-use targets, we were told, could be substantially tightened. The utility managers, in consequence, believe that this rate structure will empower them to impose demand management during the next drought or as water becomes less available for other reasons.

The genius of this particular solution is its explicit focus on fairness. Proposals for conservation pricing have foundered elsewhere when advanced solely on the basis of efficiency. Furthermore, the procedure for establishing the rate embodies three competing principles of equity, at least one of which can be seen to appeal to each of the ways of organizing and perceiving to be found among the stakeholders. These are principles of parity, proportionality and priority.[5] First, each household is allocated the same fixed allowance for human consumption (i.e., for drinking, cooking, bathing, etc.) thus meeting the requirement of *parity* characteristic of the egalitarian perspective, in which water is viewed as a basic need and human right, rather than as a commodity. Each household then receives an additional variable allowance for use outside the house – mainly irrigation of lots (front and back gardens). This allowance is determined by a formula that includes the area of each lot (obtained from real-estate records), the evapotranspiration rates of typical plantings and records of seasonal temperatures.

Thus the allowance varies by lot size and by month to allow for efficient irrigation of gardens. Charts showing usage alongside allocation have proven effective in correcting householders' tendency to over-water their yards late in the growing season. This second allowance satisfies hierarchical preferences for *proportionality* in allocation. Consumers wishing to consume in excess of these allowances are, in principle, subject to an escalating scale of charges, the rate rising more precipitously as consumption increases, although in practice punitive levels of charging have seldom been reached. However, this does allow for individualistic householders to assert their *priority* in allocation, should they choose to do so. Those adhering to individualistic beliefs are also attracted by the market-like emphasis on establishing prices and clarifying property rights.[6]

Hence, all three 'active' ways of perceiving, justifying and organizing social relations are included in the policies chosen. From the egalitarian vantage point, one can detect a strong instrument that motivates conservation as well as protecting everyone's access to sufficient water for basic needs. Through the hierarchical looking glass, one can appreciate the rationality of the strategy and its ability to help in long-term planning. From the individualistic viewpoint, it is possible to appreciate how the strategy protects the customer's freedom of choice to use as much water as can be afforded.

In the Bay Delta

Responding to the multiple problems in the Bay Delta was more complex. One piece of the novel strategy was the creation of the Environmental Water Account (EWA) to provide water for fish, while imposing no additional burdens on other users. The EWA allows fish agencies to acquire water reserves through markets; they can then time the release of purchased water so as to best protect fish habitats and thereby avoid the conditions that trigger the Endangered Species Act. Water contractors, cities and agricultural districts are guaranteed 'no surprises' that would interrupt the reliability of water supplies and no additional costs. The EWA represents a sharp change in California water policy in that it uses market-like mechanisms to provide water for fish protection. This replaces the previous reliance on state and federal regulations.

The example of the EWA also demonstrates that solutions embodying competing principles are possible. As policy theorists have observed, solutions may emerge from actions that at the time appear unremarkable.[7] Though it was not entirely clear at the time, the EWA signalled a backing away from the regulatory approach of fish protection under the Endangered Species Act. Instead of simply mandating water releases and letting water contractors bear the cost of saving endangered species, fisheries agencies themselves started to own and manage water to protect the fish. This required the fisheries managers to take on the unfamiliar role of budgeting

their water expenditures so that their supply would last the season. Farmers, too, faced a new context. Since the EWA involves voluntary water sales and contracts to a federal agency, farmers came to see sales to the EWA, not as a threat to their livelihood, but as a reasonable management option, whenever crop prices were low or farming conditions were bad. The EWA guarantees that water will be available for fish without any uncompensated cost to the contracting agencies (cities and farms). The water facilities operators (i.e., the people who turn on and off the spillways) were forced by the EWA to interact with fisheries managers in timing EWA water releases. Mutual learning began to take place as fisheries managers became sympathetic to the constraints of the built system, and operators started understanding the life cycles of fish. The EWA, in bringing about a close working relationship between fish managers and others not previously sympathetic to fisheries problems, modified the contentious relationships among the actors adhering to alternative ways of organizing and perceiving. As one water manager told us, 'Peace is not enough; we need to make progress on fisheries restoration'.

A key feature of EWA's innovative design is its dependence on water acquisition through voluntary markets rather than by governmental mandate. Water markets typically encounter considerable resistance from farming communities that see individual sellers as enriching themselves, while farming communities are impoverished.[8] Moreover, while markets make the allocation of water more efficient, they do little to halt the urban growth and development that many environmentalists oppose. Consequently, many water sales are quite controversial, even though they occur regularly and have been taking place for over thirty years. For example, the sale of water from the Imperial Valley to the City of San Diego, which transfers 200,000 acre-feet annually, took nearly a decade and the expenditure of enormous political capital to accomplish. Indeed, that transfer continues to have bitter enemies among farmers in the Republic of Mexico, some of whom will inevitably suffer negative effects. In contrast, the EWA, developed through a clumsy (and political capital-conserving) design, was negotiated in months rather than years, has moved almost as many acre-feet as the Imperial Valley transfer and has a favourable public image.

The underlying genius of this solution is that no single way of organizing is perceived as winning, and each gets just enough to make its adherents believe that the agreement represents some progress toward ultimate objectives. From the individualistic view, one can rejoice in the extension of market-like arrangements in California water systems that now move as much as ten per cent of the water.[9] Bringing the interests of fisheries explicitly into water management agreements mollifies egalitarian concerns about the natural world. And, hierarchical organizations remain the major actors in water management although both fisheries and operators take on new and unfamiliar roles.

Both these solutions to water problems in California appeal to each of the alternative ways of organizing, perceiving and justifying human relations

that are set out by cultural theory. These solutions are appealing from the individualistic perspective, as they rely on market-like mechanisms to discipline demand. The strategies also serve the environmental and social goals stressed in the egalitarian view by valuing fish protection, encouraging water conservation and ensuring equity in water pricing. Finally, the hierarchical rationale is respected, because bureaucratic agencies are not supplanted by other decision-makers, but instead take on new roles and relationships.

The conditions conducive to clumsy solutions

The emergence of clumsy water management regimes in California might never have come about, if the participants had not been convinced that they had no viable choice other than to accommodate principles that might otherwise seem anathema to them. Those who espoused individualistic values had to give up on the full dominance by markets; those who favoured egalitarian solutions had to accept the existence of unfair differences; and those inclined towards hierarchical beliefs and norms had to cede some amount of power to individuals and non-governmental organizations that do not share similar objectives. Even as the adherents of the alternative ways of organizing and perceiving make doctrinal sacrifices, they avoid big losses and have reasons to see progress in the solutions. Each group gets just enough concessions for it to be able to claim 'progress' towards its goals. Nor does it see any other group's interests and values being unduly privileged over its own.

As the introductory chapter makes clear, the alternative ways of organizing, perceiving and justifying social relations fundamentally lack a common interest. To adopt the strategies of the other is viewed as a clear defeat. However, if entering into an accommodation is seen as essential to long-term survival, collaboration can be viewed as a means to protect interests. Further, even very small gains (or no further losses) can be rationalized as the first step in the right direction. However, it would be a mistake to think that a clumsy solution will be readily adopted – no matter how astute it may be. Policy change ordinarily follows an established trajectory, responding to problems in conventional ways.[10] Since participants will tend to follow the dictates of their preferred way of organizing and perceiving, unless it is clear that there is no option but to participate in the crafting of a clumsy solution, clumsy solutions (like the EWA, and the conservation water rates) are likely to occur only when certain conditions are met. In the Californian examples, as we have seen, the following four conditions were conducive to the emergence of clumsy solutions:

Accumulating problems. Mother Nature can always be blamed for catastrophes beyond what anyone can expect agencies to plan for. Moreover, it is always possible to claim that success is just around the corner. However, when problems seem to come so frequently that they appear endemic, they begin to be

interpreted as water management failures. By the 1990s, it was hard to deny that California water management was in trouble, even though everyone was looking in different directions for solutions. The sunshine and warm climate, the long growing season and the attractive life styles drew many to arid southern California, and the state's developers and water managers always assumed that they could bring water to wherever people wanted to settle. In general, water transfers triggered little (or ineffective) resistance; water flowed (uphill, in some instances!) from the relatively unpopulated northern and eastern areas of the state to the Los Angeles region. Water was also always available to support the large agribusiness of California, and any adverse environmental impacts were largely ignored or partially mitigated until the rise of the environmental movement. From an environmentalist's perspective, water is an inseparable element of an ecosystem. The characteristics of water, including its quantity, chemical composition, temperature and turbidity, are specifically suited to the place in which it is found. Stream temperature, for example, is finely tuned for salmon habitat and will be affected by water impoundments, thereby making the stream unsuitable for its native species. For environmentalists, ecological problems represent a flawed relationship between humans and the environment, not an engineering problem that can be fixed.[11] The challenge of an environmental perspective on water is supported in part by state and federal regulations, especially the Endangered Species Act and the Clean Water Act, both of which recognize that northern California water supplies are required in their natural basins to support threatened habitats and to protect water quality. However serious the need in the south, water could no longer be taken from the north, where it was needed to support endangered species and to provide potable water for a growing population. By the end of the twentieth century, it was clear that water agencies would have to find new ways of supplying water to growing populations: ways that had less impact on fish habitat and water quality.

More to lose by inaction. Water politics in California came to be governed by a vicious triangle. Agricultural users, often with the most senior water rights, believed they were unfairly burdened by environmental regulations. Farmers could point to innumerable sacrifices and investments made by them to preserve and protect water-based habitat. Many asserted that continued agricultural production, essential to the California economy, was in danger. Unless farmers prospered, they argued, rural communities would wither and farm-related businesses would fail. Municipal water utilities, however, maintained that residential and industrial use of water represented a much higher economic value than agriculture; moreover, the lives of many people, rather than just crops, were at stake. For urban users, implementation of the Endangered Species Act was causing problems for water reliability and quality, the organizational imperatives for municipal water utilities. Environmentalists, as the newcomers among water managers, believed that they should not have to make any sacrifices to urban or agricultural interests, since the ecosystem had already been dangerously over-exploited. The notion of further water development was intolerable and could only compound the existing problems. All three interests were convinced they had nothing more to relinquish in compromise. On the outside of this fractious water community, Californians were beginning to believe they were poorly served by the policy-making system. The drought and the 'smeltdown' raised public consciousness about water problems and mobilized parties outside the triangle. For example, the Chamber of Commerce began to worry about the business climate in California.[12] National figures, like then-Secretary of Interior Bruce Babbitt, and then-Governor Pete Wilson, deciding it was time for political intervention, threatened to remove decision responsibility from the usual players. At this point, the members of the triangle realized they had more to lose in a deadlock or delay than by considering new approaches. Finding peace among the warring parties (even if it meant deferring the satisfaction of core values) became a high priority for all involved. Without some sort of accommodation, each perspective faced certain loss of autonomy and reputation.

Experience with settlement. In the California examples, there is evidence of experimentation with collaborative arrangements, especially as water resource agencies became increasingly involved in multi-purpose water projects. Since multi-purpose water projects include as many beneficiaries as possible, water agencies have reached beyond their usual constituencies to include recreational users (boaters, fishers, bird watchers) and environmentalists, as well as fish and wildlife agencies. Over time, however, demands from these new constituents have changed project designs from the traditional storage and transfer structures to include non-structural alternatives such as conservation practices, protection of floodplains and other habitats.[13] As water problems worsened in California, multi-purpose projects became more contentious and cooperation faltered. Even so, representatives of the competing interests were able to collaborate on specific projects when it was clearly in their mutual interests. For example, agricultural interests and municipal water utilities collaborated on the Peripheral Canal proposal to bring increased water supplies to the south by bypassing the Bay Delta. While this particular proposal was ultimately defeated, the parties came to accommodate one another's values, and environmentalists and municipal water utilities subsequently collaborated in support of agricultural reforms such as the Central Valley Improvement Project, which transferred 800,000 acre-feet per year from agricultural uses to improve fish and wildlife habitat.

Pressure to break the long-standing deadlock over water management in the Bay Delta was intensified when then-Governor Wilson ordered the state to withdraw water quality permits. To defuse some of the conflict, federal agencies took the initiative to coordinate all the federal resource agencies through a Federal Ecosystem Directorate, more popularly known as

'Club Fed'. The state Water Policy Council agreed to join with Club Fed to coordinate activities in the Delta. There followed a series of semi-formal meetings that included not only federal and state agencies, but also representatives of water contractors, farmers and environmentalists. Ultimately, the federal government agreed to purchase additional water, beyond that needed for protections under the Endangered Species Act, in exchange for water user groups contributing resources for fish protection. This was only one of many experiments using collaboration to resolve water problems in California.

Leadership willing to take risks. The kind of leadership needed to craft clumsy solutions is different from that usually found in bureaucracies. What characterizes 'clumsy' leaders is not their roles, positions or access to resources, but their willingness to take risks that appear to challenge alternative perspectives. The motivations for risk-taking are hard to generalize, as they arise out of particular contexts. For example, informants who explained why San Juan Capistrano adopted an innovative rate structure said that they were so small and marginal that they saw themselves as partial outsiders to the municipal water utility community, and were able to 'reject orthodoxy' that insisted on cost of service rates. In contrast, the environmentalist representative in the group that first considered the EWA actually changed his mind during the course of discussion. He came to understand the positions of other users and accepted that fisheries should operate under the discipline of a water budget – just as do agriculture and municipal water utilities. Leaders looking for clumsy solutions are often self-selected; nothing in their job description or experience would lead them to deviate from organizational norms. The impetus for change seems to be a result of the factors described above. They know the accumulation of previous failures and they understand the unsupportable costs of continued stalemate. Further, they are the ones who have previously participated in collaborative efforts. In face-to-face encounters they hear other values articulated and realize that their own answers are not satisfactory to their collaborators. Leaders, more than other engaged parties, realize that creativity is required for finding viable solutions.

Conclusions

The examples in this chapter illustrate the usefulness of the theory of sociocultural viability, in both illuminating problems and crafting solutions. While the physical problems of a growing population and of dealing with water scarcity are real, underlying the deadlock that characterized water politics in California at the end of the twentieth century was a fundamental value conflict among upholders of different ways of organizing and perceiving. The bureaucrats, who had long dominated water in their time-honoured hierarchical manner, were challenged on two fronts: by more egalitarian groups interpreting the problems through ecological and social equity terms, and by more individualistic organizations looking to markets as an obvious solution.

As described in the opening Chapter, collaborative and seemingly messy solutions may offer the only viable alternatives for many long-standing and apparently intractable resource problems. In addition to the design of clumsy solutions, the examples provided in this Chapter suggest that the process of clumsy collaboration may be as important as the designs themselves. As we have observed, the beginning of the process is often the realization that the status quo is simply not sustainable. This challenge often comes from those outside the immediate decision making arena, and participants have to choose between collaborating or losing control over outcomes.

Policy change is often described in terms of dramatic discontinuities and obvious innovations.[14] What we observed in these Californian cases, however, was that change was preceded by tentative experiments as well as narrow, short-term agreements. Adherents of the different ways of organizing, perceiving and justifying, it would seem, need to practice collaboration, gaining capacity for forging agreements across values and organizational objectives, and gaining trust and respect for other perspectives and participants. Those who see policy change as a reframing of issues may overlook the extent to which the core values of the participants remain the same. Collaborators do not have so much a change of heart, as a recognition of new realities. A part of clumsiness has to do with the awkwardness of carrying forward distinct values and norms, as participants gain experience and skill in collaboration with those adhering to alternative ways of organizing and perceiving. Because clumsy solutions carry the history of their making along with them, they are understandably inelegant.

Prior to the progressive era, more individualistic organizations and people dominated natural resource management, and the result was over-exploitation and system failure.[15] In response, science and bureaucracy were elevated in order to manage resources rationally to serve more orderly economic development.[16] As a consequence, California had a 'golden age' of expansion, growing to the sixth largest economy in the world.[17] Unbalanced control by the hierarchically-minded, however, produced system-inefficiency and severe environmental and social inequity. Sensing an opportunity for their turn to dominate water policy in California, egalitarian groups pressed for a new era of decentralization, appropriate technology and the husbanding of all natural resources, including water. Our study suggests that holding onto such singular hopes, or expecting to return to some singular past, leads only to deadlock. Clumsy solutions to California water problems begin to look like very good solutions that others can learn from.

Notes

1. The Bay Institute, *From the Sierra to the Sea* (San Rafael, CA: The Bay Institute, 1998).
2. For example, Bruce Lankford, Barbara van Koppen, Tom Franks and Henry Mahoo, 'Entrenched Views or Insufficient Science? Contested Causes and Solutions of

Water Allocation: Insights from the Great Ruaha River Basin, Tanzania', *Agricultural Water Management* (Vol. 69, No. 2, 2004), pp. 135–53; Steve Rayner, Denise Lach and Helen Ingram, 'Weather Forecasts Are for Wimps: Why Water Resource Managers Don't Use Climate Forecasts', *Climatic Change* (Vol. 69, No. 2–3, 2004), pp. 197–227.

3. For example, Bridget Callahan and Edward Miles, 'Policy Implications of Climate Forecasts for Water Resource Management in the Pacific Northwest', *Policy Sciences* (Vol. 32, No. 3, 1998), pp. 259–83.
4. For instance, Terry Anderson and Donald Leal, *Free Market Environmentalism* (New York: Palgrave, 2001); Jon Elster, 'Social Norms and Economic Theory', *Journal of Economic Perspectives* (Vol. 3, No. 4, 1989), pp. 99–117; Lee Epstein and Jack Knight, 'Building the Bridge from Both Sides of the River: Law and Society and Rational Choice', *Law and Society Review* (Vol. 36, No. 2, 2004), pp. 207–12; Gary Miller, 'Rational Choice and Dysfunctional Institutions', *Governance* (Vol. 13, No. 4, 2000), pp. 535–47.
5. Peyton Young, *Equity in Theory and Practice* (Princeton, NJ: Princeton University Press, 1993); Steve Rayner, 'A Conceptual Map of Human Values for Climate Change Decision Making', in A. Katama (ed.), *Equity and Social Considerations Related to Climate Change: Papers presented at the IPCC Working Group III Workshop* (Nairobi: ICIPE Science Press, 1995).
6. Michael Thompson and Steve Rayner, 'Cultural Discourses', in S. Rayner and E.L. Malone (eds), *Human Choice and Climate Change: An International Assessment Volume I, The Societal Framework*. (Columbus, OH: Battelle Press, 1998.)
7. Paul Pierson, 'Increasing Returns, Path Dependence, and the Study of Politics', *American Political Science Review* (Vol. 94, No. 2, 2000), pp. 251–68.
8. For example, Henning Bjornlund, 'Farmer Participation in Markets for Temporary and Permanent Water in Southeastern Australia', *Agricultural Water Management* (Vol. 63, No. 1, 2003), pp. 57–76; Victor Galaz, 'Stealing Water from the Poor? Game Theory and the Politics of Water in Chile', *Environmental Politics* (Vol. 13, No. 2, 2004), pp. 414–37; Dan Tarlock, 'New Water Transfer Restrictions: The West Returns to Riparianism', *Water Resources Research* (Vol. 27, No. 6, 1991).
9. David Brookshire, Bonnie Colby, Philip Ganderton, Mary Ewers, Bonnie Colby and Steven Stewart, 'Water Markets in the Southwest', *Southwest Hydrology*, March/April 2004.
10. Frank Baumgartner and Brian Jones, *Agenda Instability and American Politics* (Chicago, IL: Chicago University Press, 1993).
11. W. Douglas Costain and James Lester. 'The Evolution of Environmentalism', in James P. Lester (ed.), *Environmental Politics and Policy: Theories and Evidence* (Durham, NC: Duke University Press, 1995), pp. 15–38.
12. Elisabeth Rieke, 'The Bay-Delta Accord: A Stride Toward Sustainability', *University of Colorado Law Review* (Vol. 67, No. 2, 1996), p. 341.
13. Jeanne Clark and Daniel McCool, *Staking Out the Terrain: Power and Performance among Natural Resource Agencies* (Albany, NY: SUNY Press, 1996).
14. Baumgartner and Jones, op. cit.
15. Samuel Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement 1890–1920* (Cambridge, MA: Harvard University Press, 1950).
16. Costain and Lester, op. cit.
17. Peter Schrag, *Paradise Lost: California's Experience, America's Future* (Berkeley, CA: University of California Press, 2004).

11

Clumsy Conclusions: How to Do Policy and Research in a Complex World

Marco Verweij, Michael Thompson and Christoph Engel

John Maynard Keynes, who was not renowned for his politeness, once wrote on a Treasury paper that had been passed to him for comment: 'I would be in full agreement with this if the word "not" was inserted in every sentence.'[1] Much the same, we feel, holds for orthodox policy analysis. Indeed, as we have argued for some time now,[2] much progress can be made simply by slipping the words 'not' or 'never' into the precepts that have long been drummed into the heads of those who aspire to be policy analysts:

- A single, agreed definition of the problem is the first essential.
- Always clearly distinguish between facts and values.
- Establish a simple metric – dollars, quality adjusted life years, expected utility, etc – so as to be able to compare and assess policy options.
- Optimize.

Turning all these 'dos' into 'do nots', we might expect, would be mightily resisted, both by those who analyse policy, and by those who make or implement it. Indeed it was, when these heretical shibboleth-inversions were first proposed, twenty or so years ago. Back in the 1980s, for example, when John Adams first spelt out the implications of the risk compensation hypothesis for Britain's road safety policy (recounted in Chapter 6 of this book), enraged cabinet ministers demanded that he be dismissed from his university position. A few years later, a senior British policymaker, Sir Kenneth Barrill, told Brian Wynne (who had been predicting that the insistence of the British government on a single definition of technological and environmental issues would lead to a decline of public trust and consent; predictions that later materialized spectacularly with the crises over mad cow disease and foot-and-mouth disease)[3] that, whilst there was much truth in what he said: 'when it comes to the actual business of deciding policy, you can sod off!' Around the same time, when one of us proffered similarly helpful advice to the United Nations Environmental Programme (in relation to environmental

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Clumsy Solutions for a Complex World

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