

# Metaphors and Methods for Institutional Synthesis

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Contents

<b>Abstract</b> .....	<b>ii</b>
<b>Introduction</b> .....	<b>1</b>
<b>1. Invisible Irrigation in Northeast Thailand</b> .....	<b>2</b>
<b>2. Establishing Organizations or Solving Problems?</b> .....	<b>6</b>
<b>3. Metaphors and Methods</b> .....	<b>8</b>
3.1 Building .....	8
3.2 Crafting .....	10
3.3 Bricolage .....	12
3.4 Discourse .....	15
3.5 Adaptation.....	17
<b>4. Conclusions</b> .....	<b>18</b>
<b>Endnotes</b> .....	<b>21</b>
<b>References</b> .....	<b>23</b>

## ***Table***

Table 1. Alternative metaphors and methods .....	20
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## Metaphors and Methods for Institutional Synthesis

### ABSTRACT

*In the design space between blueprint panaceas and spontaneous order, what scope is there for deliberate institutional artisanship to apply ideas from institutional analysis and design (IAD) and related social science?*

*This paper briefly surveys approaches to improving institutional design, focusing on applications for irrigated waterscapes and other contexts of institutional diversity. Concepts such as building, balancing, aligning, crafting, fitting, adapting, improvising, and navigating institutions identify assumptions and opportunities for influencing changes in collective action. Analysis suggests what may be necessary, favorable, vulnerable, feasible, or ideal, but better strategies are needed to foster the synthesis of diverse institutions that are not just workable, but good. The range of approaches available may include not only offering examples, enforcement, funding, technical diagnosis, and facilitation processes, but also expanding options, switching starting points, challenging assumptions, asking about design principles, and appreciative inquiry. Examples from irrigation in northeast Thailand and other parts of Southeast Asia illustrate challenges and opportunities for improving institutional artisanship.*

## INTRODUCTION

This paper takes a preliminary look at some methods to improve institutional design in water governance. In particular, it is concerned with what may be done to improve institutional artisanship (V. Ostrom 1980),<sup>1</sup> through the application of institutional design principles (E. Ostrom 1990, 1992, 2008) and related social science knowledge. As a reflection on what has been learned and still needs to be learned, the paper is concerned with ways to improve the *design* part of Institutional Analysis and Design (IAD). Analysis helps understand what may be necessary, favorable, vulnerable, feasible, or ideal, but better strategies are needed to foster the synthesis of diverse institutions that are not just workable, but good.

The IAD framework has helped shape institutional analysis in irrigation as in other fields, (Tang 1992; Lam 1997). Research on irrigation was one of the sources of “design principles” (Elinor Ostrom 1990). This research has contributed to a better understanding of institutional diversity, including in water governance. It has stimulated attention and policy changes intended to encourage more “self-governance,” most notably including programs for irrigation management transfer (IMT). However, to the extent that principles of institutional design and other IAD–related research have been applied, this has sometimes been done only in very broad, crude, and often oversimplified “blueprint” ways (Ostrom 2008). If IAD is about not just analysis, but also design, then it is worth asking what can be done to improve institutional design, to look not only at analysis but also *synthesis*, the ways of improving how institutions are created, modified, combined and otherwise transformed.

The first section of this paper describes episodic mobilization to build earthen irrigation weirs in northeast Thailand, as an illustration of the need to design for institutional diversity. The second section highlights the potential to shift development of water governance from establishing organizations towards more practical and productive problem-solving. The third section discusses metaphors and methods related to institutional design, including building, crafting, bricolage, discourse and adaptation, including risks and opportunities in terms of how such metaphors may be interpreted and put into practice.

## **1. INVISIBLE IRRIGATION IN NORTHEAST THAILAND**

Farmers have sculpted the undulating landscape of northeast Thailand into gentle cascades of terraces, where runoff water flows from field to field. Farmers block and control flows using earth bunds, ranging from small bunds delimiting paddy fields to earth dams of meter or two in height (Bruns 1990, 1991; Hoshikawa and Kobayashi 2003, 2009). The slight differences in elevation mean that in many places weirs can divert water directly into the adjoining floodplain. Slopes are often too slight for canals to transport water over long distances. Farmers mobilize episodically to build and rebuild weirs, usually in advance of the wet season or after weirs are damaged by high flows, which may happen repeatedly during a season. Aside from weir construction and reconstruction, there is often little or no organized collective action to distribute water, clean canals, or carry out other irrigation-related tasks.

In northeast Thailand, wet season streamflows shift erratically from flood to trickle, rising and falling in a feast-or-famine pattern, particularly during the first part of the wet season when irrigation is most helpful in starting rice production. The gentle topography

means that streams rise and fall more slowly than in more mountainous terrain.<sup>2</sup> In the dry season, most streams stop flowing completely, without the kind of base flows fed by mountainous catchments that yield a second irrigated crop in areas such as northern Thailand. In most parts of the northeast, irrigation using earth weirs supplements rainfall in locations where it is feasible, and is just one part of the variety of ways that farmers reshape the landscape to capture and control rainfall and runoff.

In between periods of high flow, those closest to a weir may still gain enough water to help start and sustain a crop. During periods of high flow, water is spread abundantly across a wide area. Thus, the ability to restrict access and extent to which water use by one farmer takes water away from another is not constant, but varies. This variability in wet season flows creates a situation quite unlike that of dividing a relatively stable dry season flow to grow a second crop.

Weirs are built or repaired before the rainy season, and often rebuilt after flood damage. Weir construction and repair may be organized by weir “owners,” (the farmer or farmers with land adjoining the weir); by an informal weir committee, *kammakarn fai*, of leading villagers with land that benefits from the weir; by official village leaders, such as village headmen, *puyaiban*; or by a combination of these. Variability and uncertainty of field-to-field flows make for a fuzzy set of beneficiaries. This contrasts with the sharply demarcated boundaries typical of many canal irrigation systems, especially in arid climates.<sup>3</sup> Resource mobilization is framed not only in terms of who benefits specifically from irrigation, but in terms of mutual aid among fellow villagers and participation in community activities. Thus it is not limited to strict sharing of costs among beneficiaries but also involves specific or generalized reciprocity within the

community.<sup>4</sup> The diversity of motives is most clearly demonstrated by labor contributions from households without fields served by the weir.

As mechanized equipment, such as tractors, backhoes and bulldozers, has become available, farmers have used them to level fields, dig ponds, and build earthworks, continuing the process of reshaping the landscape to suit their needs. Cement and steel have been used to build gates to control water, sometimes from local resources and sometimes with government funding, increasing control and durability of weirs (though weirs are still often subject to washing out or being bypassed as streams form new channels). In the last two decades many farmers have shifted from transplanting seedlings to direct seeding of rice, due in part to increasing scarcity and cost of labor, and availability of herbicides. Direct seeding may bring a need for even better water control during the early stages of growth.

Government funding for building weirs and dredging streams has become increasingly available over the past several decades, giving government an increasing role in construction. Farmers remain responsible for operating most structures, except some larger ones built by the Royal Irrigation Department.

Over time, earthen weirs become overgrown with grass, bushes, bamboo, and trees. The irrigation infrastructure of earthen weirs is far less visible than concrete weirs and canal networks. Irrigation organization also shows little routine activity, only becoming apparent during episodic mobilization to rebuild weirs. Thus both the infrastructure and social organization are relatively “invisible” (Bruns 1987). This contrasts with the relatively formal roles and routine activity characteristic of well known and studied examples of local irrigation, such as the *subaks* of Bali, *zanghera*'s of the northern

Philippines, locally managed irrigation in Nepal, *acequias* in New Mexico, and communal irrigation systems in northern Thailand. One could characterize much irrigation in northeast Thailand as “lowly organized,” in contrast to the highly-organized systems that feature in much of the irrigation literature.

Relatively informal and episodic organization to build and repair irrigation weirs in northeast Thailand, with little in the way of canal networks or collective action in water distribution, fits a landscape and waterscape very different from northern Thailand, Bali, Ilocos Norte, Spain, Colorado, New Mexico, etc. In terms of the Institutional Analysis and Design conceptual framework, the characteristics of variable and uncertain flows; gentle topography; shifting levels in resource subtractability and excludability; and the disparate salience of irrigation among different farmers can help explain the reliance on episodic and lowly-organized collective action. Irrigation development that only concentrates on the minimal level of assured supplies would forfeit the opportunity to use more abundant flows. In areas with steeper stream gradients, weirs are more often accompanied by canals (Hoshikawa and Kobayashi 2009)

The main point of this example is to emphasize that irrigators organize in diverse ways, not only as seen in highly-organized, long-enduring “successes.” Irrigation development is not necessarily always a matter of emulating the characteristics of robust, long-enduring systems that are prominent in the literature. Instead, the need is to deal with what may be feasible and worthwhile under specific conditions.

## **2. ESTABLISHING ORGANIZATIONS OR SOLVING PROBLEMS?**

Much effort in the development of irrigation and water resources has gone towards the construction of organizations, particularly water user associations (WUAs) and river basin organizations (RBOs). Projects have assumed that such organizations must be established to accomplish objectives such as effective irrigation operation and maintenance (O&M) and river basin water allocation. In part this seems due to a mechanistic approach to capacity building, as if an organization must first be constructed, and then can be expected to operate as designed. The risk is that of “putting the cart before the horse,” focusing on the more easily achieved outputs of setting up new structures, rather than growing institutions or delivering worthwhile results.

Setting up river basin organizations convening workshops, and producing plans is much more easily done than actually changing water abstraction. As a result of the limited accomplishments of IWRM, the feasibility of excessively comprehensive and ambitious approaches is now increasingly questioned (Biswas 2004; Lankford et al. 2007; Schlager and W. A. Blomquist 2008).

While IWRM and RBOs have dominated the conceptualization of policies and projects, water agencies, political authorities and others, including provincial governors, district heads, and legislators, continue to struggle with the consequences of specific problems such as reduced dry season flows, flooding, and seawater intrusion on drinking water supply sites. An alternative may lie in pragmatically concentrating on specific problems and results, such as more even and reliable supply or irrigation or resolving particular water conflicts. IWMI researchers drawing on work in Tanzania have

called for more “expedient” approaches. Watershed systems may be “decomposed” (Schlager and W. A. Blomquist 2008) into specific subsystems within which management action can take place to address particular problems. While stakeholder consultation and collaboration may be important, crafting coalitions sufficient to make changes may be crucial.

The sad truth of PIM is that it is much easier to form WUA than to improve water delivery or maintenance. Furthermore, WUA often quickly fade away, or only last as long as they are useful in obtaining project funding. Research on irrigation management has shown the diversity and energy of irrigators in devising ways to deal with water shortages. Underneath the facade of formalizing WUAs, one often finds the persistence of past practices (Bruns 2008).

The results of IMT projects have been mixed, and usually far less than expected or claimed by proponents (Rap 2006). While substantial restructuring has occurred in some cases, such as in Colombia, Mexico and Turkey, particularly where agriculture is relatively commercialized; elsewhere, particularly for rice irrigation systems with many smallholders, IMT has not achieved the ambitious hopes of radically rearranging institutional relationships that underlay the design of projects such as in Andhra Pradesh, the Philippines, and Indonesia.

In more general terms, the shift discussed here can be seen as part of what Shivakumar (Shivakumar 2005, drawing on Vincent Ostrom and others) discusses as a problem-solving approach, in contrast to technocratic modernization. The objective of this paper is not to reiterate critiques of IMT and IWRM, nor to revisit the analytic intricacies of change in various cases, but to look at what sort of metaphors and

methods for institutional design are available to apply as part of a shift to a problem-solving approach capable of dealing with diversity in institutions, problems, and solutions.

### **3. METAPHORS AND METHODS**

The metaphors and methods discussed in this section illustrate both perils and potentials for improving institutional design, particularly institutional synthesis able to blend old and new ideas to forge effective solutions.

#### **3.1 Building**

The need to develop institutional capacity in water resources management is now widely accepted. Projects often seek to “replicate” particular models or best practices. These may emulate examples such as traditional self-governing irrigation systems; Mexico’s irrigation management transfer program; the Tennessee Valley Authority (TVA), or collaboration for adaptive watershed management on the Columbia River. Projects often assume a rather mechanical approach to organizing, as if it is a matter of assembling uniform units into a standard structure, little different from civil works construction. The shortcomings of “blueprint” approaches to development have been the object of critique at least since David Korten’s classic article (1980) on learning process approaches in international development. He argued for better processes for developing effective and efficient models, which could then be expanded. More recent critiques have emphasized the inherent flaws of pursuing idealized models, panaceas, or “one best way,” and instead argued the need to understand political contestation and

institutional diversity (Mollinga and Bolding 2005; E. Ostrom, Janssen, and Anderies 2007).

Architects create miniature models to visualize proposed structures. Engineers make physical models and mathematical models to understand and test the feasibility of different processes and structures. A key advantage of models is that they can be adjusted to try out various possibilities in advance. Models may suggest that one solution is feasible, and that area of design space is worth more exploration. Blueprints are actually supposed to be customized documents, showing a design devised to fit a particular need and set of local conditions. In principle, architects and engineers should draw on their technical expertise and creativity to respond to the requests and priorities of owners. Interactive modeling can be used to consult with stakeholders about the consequences of different scenarios. The problem may not be with the general idea of blueprints, but with their misapplication, particularly the pursuit and rigid imposition of inappropriate and overly standardized designs in processes over which those affected have little voice or power.

Metaphors of construction may also invoke ideas about institutional mechanisms, such as aligning incentives (Williamson 1996) and setting up checks and balances. A more customized approach could start by concentrating on current community practice, offering a menu of alternative institutional mechanisms. Such an approach can draw on the results of research that documents institutional diversity and customized solutions devised to fit different conditions. Rather than insisting on a particular model of irrigation organization or watershed governance, a menu of institutional options could be provided for consideration.

Clusters of practices may have proved robust and sustainable in many different contexts, such as patterns found in many irrigation systems (Trawick 2003; Trawick 2006). These are one step more specific than Ostrom's more abstract principles of irrigation design. These sets of patterns could be argued to be a necessary imperative, as Trawick seems to suggest. However, another option would be to treat them as worthy starting points for considering institutional arrangements. They can help indicate directions that might be taken, options that deserve consideration. Understanding of such institutional mechanisms that have often been found to be good for managing irrigation could even be the basis for identifying a "pattern language" (C. Alexander 1964; C. Alexander et al. 1977) of time-tested components, capable of being combined in diverse ways to fit particular circumstances.

### **3.2 Crafting**

In IAD, crafting of institutions has been a dominant metaphor (E. Ostrom 1992). Researchers have studied how irrigators and other commoners have devised rules through long processes of trial and error, drawing on local ingenuity to overcome various challenges. Crafting could imply that every situation is unique and needs its own unique solution, with little or nothing to be learned from elsewhere.

Principles of institutional design offer a more abstract set of criteria that can be suggested for consideration in institutional design, compatible with a variety of different customized solutions. However, there is a risk that this still leads to simplistic attempts to force institutions to conform to the principles, regardless of relevance or feasibility under particular conditions. Analogous to the "theory of the second best" in neoclassical economics, there is no guarantee that moving toward the principles will always make

things better. A more specific proposal for how to apply the principles of institutional design is to use questions related to design principles, e.g. about boundaries, who is involved in decisions, sanctions, sharing of benefits and costs, nesting of organizations, etc. (E Ostrom 2005; 2008).

A variety of processes are available to enhance crafting of rules, including the many techniques associated with participatory rural appraisal (PRA). These can provide useful, and often enjoyable, methods for bringing out information, analyzing relationships, and assessing potential changes. Joint walkthroughs and sketch maps have already been core techniques in many projects seeking to increase participation in irrigation management. Seasonal calendars can help to clarify the periods when irrigation is most critical, and when canal cleaning and other maintenance is usually done. Venn diagrams illustrate relationships with different organizations. Group preparation of simple two-column lists of problems and potential solutions can be surprisingly effective in shifting the focus from complaints to problem-solving. However, there is a risk that walkthroughs and other exercises may become focused on creating a wish list of infrastructure improvements, rather than considering options for changing the software of rules, roles, and rights. Systematic approaches to diagnosis may be useful in concentrating attention productively on ways in which management might be changed.

Recent work on irrigation management from a primarily technical perspective has recognized how the complexity of water flows may require learning how to manage large canal irrigation systems as complex adaptive systems (Daniel Renault, Facon, and Wahaj 2007; D. Renault and Makin 1999).<sup>5</sup> These methods are supposed to be

based on diagnostic activities done with the participation of irrigation operators, farmers and other participants in irrigation management. Such a process is intended to proceed through experimental and incremental testing and refinement of improvements in irrigation operations and infrastructure.

There is much potential to combine diagnostic questions related to institutional design principles with problem solving techniques, from PRA and from technical analysis of irrigation O&M, in order to support and enhance crafting of better irrigation governance.

### **3.3 Bricolage**

Cleaver and Franks (2003) argue that “institutions elude design,” making it problematic to assume conscious, rational crafting by narrowly self-interested actors.<sup>6</sup> They suggest that change is better understood as a process of institutional bricolage, an improvisational reweaving of old, new, and repurposed ideas and practices, only partially subject to deliberate choice. Their critique emphasizes the multiplicity and ambiguity of identity, interests and culture. This challenges the notion that principles of institutional design may be easily applied, especially by outsiders unfamiliar with the complexity of local context.

The difficulty of institutional design and the importance of bricolage have been argued particularly in the case of resources with multiple, contingent users, fuzzy and shifting boundaries; varying salience; and culturally diverse users who may lack common concepts and norms. At the extreme, it could be that resource use is so messy, confusing and contested that deliberate institutional design, by insiders or outsiders, is impossible. However, Cleaver and co-authors conclude not by abandoning

hope for institutional design or external assistance, but call for institutional development to be done in ways better fitted to local contexts, with more modest ambitions in terms of the feasibility, pace, and extent of change.

Complexities in resource use and cultural diversity, certainly pose challenges for institutional design, especially if outsiders try to design without a good knowledge of local conditions. Furthermore, if institutional development relies heavily on spontaneous self-organization and tacit knowledge, attempts at deliberate change may pose serious risks of making things worse rather than better. Critiques in terms of bricolage help to warn against oversimplifying and idealizing how rules are made and put into practice.

The concept of bricolage also challenges, and offers a way to avoid, oversimplified assumptions about the degree of sharing of local culture. Cultural concepts are potentially ambiguous, subject to multiple interpretations and contestation. Bricolage in institutional design provides a way to see culture, including words, norms, and rules, as ideas that at best are only partly shared and often contested.

At the level of institutions, it is worth noting some resemblance to ideas in the IAD tradition on polycentric governance, particularly the ways in which governance may not fit within neat hierarchies, but instead may occur through multiple organizations of different scale and scope. What may at first appear confused, fragmented, redundant, conflicting, and inefficient may actually perform better than the apparent rationality of centralized control (for examples, see Oakerson 1999; Blomquist 1992). Furthermore, work on polycentric governance has emphasized how institutions have been built incrementally from the bottom-up through cooperation among different organizations to solve specific problems.

One example in irrigation of apparent inconsistency and conflict is the tension between administrative boundaries and resource units, such as irrigation canal networks and watersheds. Attempts to develop WUA and IWRM have often sought to establish new organizations based purely on hydraulic logic. While pointing out the value of organizations that fit resource units, IAD research has also shown the messy mixture of organizational forms and levels that may be part of polycentric governance. In many cases, attempting to reorganize irrigation governance along hydraulic lines has been a futile and superficial exercise, more likely to destroy than build social capital. Attempting to exclude or bypass local political authorities is often a recipe for failure. Approaches that acknowledge and make appropriate use of existing institutions, including the roles of village governments in supporting irrigation, are more likely to meet with success.

Another set of potentially useful ideas comes from Appreciative Inquiry (Cooperrider and Srivastva 1987; IISD n.d.; Braun 2005). In contrast to the typical emphasis on “problems,” Appreciative Inquiry switches the focus to asking people about those things that they feel are working well, are valuable, and might should be used as a basis for making things even better. In its pure form, Appreciative Inquiry stresses the “unconditional positive question” as the basis for discussion. Rather than a negative emphasis on deficiencies the shift is toward examining what is good and what more could be done with it. Psychologically, this can change from a critical and analytical mindset to one that is more confident and creative.

Concepts of bricolage can highlight the importance of improvisation, encouraging making use of what is available, without waiting for complete analysis and deliberation.

Rather than requiring comprehensive data, planning and consensus, more partial and pragmatic approaches can be applied, and refined through trial-and-error learning.

At the local level, institutional bricolage can be seen as part of a more nuanced approach to culture, contestation and improvisation in institutional design. In the emphasis on improvisational use of what is available, and the prevalence and utility of what may at first appears confused, fragmented and inefficient, there are significant commonalities between ideas of institutional bricolage and polycentric governance. Relevant methods may include encouraging improvisation, appreciative inquiry, and helping explain the effectiveness of apparently messy, improvisational approaches.

### **3.4 Discourse**

The conventional language of water user associations and integrated water resources management dominates much contemporary discussion about water governance, framing policies, laws, and project designs. Such hegemonic language may make it difficult or impossible to understand other ways of organizing, such as episodic mobilization by relatively informal committees as discussed in the first section of this paper.

As government agencies seek to “establish” or “develop” WUAs, local organizations are often treated like miniature bureaucracies, understood and evaluated in terms of compliance with laws and regulations, with an emphasis on legal status, constitutional charters, formal roles, and written reports. Similarly, discussions about watershed management easily become oriented around agency jurisdictions and administrative units, and establishment of new organizations, such as river basin organizations, or coordinating arrangements, such as committees.

In contrast to the one-way imposition of new organizational forms, discourse can be much more of a two-way, or multi-way, process of dialogue and mutual adjustment. This offers much more space for drawing on social science knowledge to contribute to conversations about institutional design. A first, and important, aspect is showing the existence and of local institutions, and the ways they may offer useful services and a basis for improvement, rather than acting as if institutional development were starting from a blank slate.

Language may be used to redefine problems, to reframe them in ways that make it easier to see new possibilities and solutions. Social science analysis, including IAD, can contribute to this, to the extent that it can be presented in terms of concepts and criteria that are relevant to stakeholders.

For the synthesis of institutions, many methods are available for facilitating dialogue. Some, such as mediation, may draw on structured procedures of alternative dispute resolution. Interest-based negotiation (Fisher, Ury, and Patton 1991) represents one, sometimes counterintuitive, example of how such processes can shift interaction into more fruitful directions, from zero-sum positional bargaining to interest-based pursuit of mutual gains. Much work has been done on convening and developing collaborative approaches to watershed management (see, for example, Sabatier, Weible, and Ficker 2005; Boelens et al. 1998; Steins and Edwards 1998). Other methods are more oriented toward facilitating participation, toward inclusive processes increasing the voice of those who may be affected.

### 3.5 Adaptation

Water resources development can be seen as a largely unilinear process, driven by increasing scarcity to converge on a standard set of best practices (see, for example, Saleth and Dinar 2004). From an economic perspective this has often assumed the need and eventual inevitability of shifting toward market methods for water allocation, within irrigation systems and river basins.

In contrast to assumptions about convergence and unilinear evolution however, institutional evolution may be seen as a multilinear process (Steward 1972). Change may follow various pathways to reach an array of different destinations. As in the example in the first section of this paper, different institutions may adapt to different conditions. Even where physical conditions are similar, historical factors may result in very different sets of institutions. Institutional change is often path dependent, as processes become self-reinforcing and relatively “locked” in to a particular pattern (P. Pierson 2000, 2004)

Ideas about cycles in complex adaptive systems may point out the importance of timing. After periods of accumulating stress and complication, ordered arrangements collapse and then reorganize, in an adaptive cycle (Gunderson and Holling 2002). Periods of slow accumulation are followed by collapse and reorganization. Putting institutional development into such a context may help show the importance of particular moments of change. Irrigation in northeast Thailand can be seen as “pulsed” socio-technical systems, both in the seasonal alternation of rainfall and aridity, and the uncertain timing, size, and duration of stormflows. Indigenous irrigation has been organized in terms of episodic mobilization to construct and reconstruct earth weirs.

Looking at policy in terms of punctuated evolution (Repetto 2006) illuminates the importance of critical events, and the differences between those moments and more common periods of more gradual change.

Path dependence and the crucial impacts of change during crisis contrast with assumptions that the need and feasibility of change is relatively uniform. They can offer institutional artisans an understanding and rationale for identifying opportune times, places, and pathways for redesigning institutions.

#### **4. CONCLUSIONS**

This paper began with an example from Northeast Thailand illustrating the need for approaches to institutional design that can deal with diversity in environments and institutions, for example in supporting forms of organization that may be relatively weak and episodic, rather than always needing to be strong and highly organized. In seeking better ways to share water, approaches are needed that can support problem-solving by stakeholders, acting as institutional artisans to develop solutions that fit their conditions rather than concentrating on establishing formal organizations in hopes that they will then fulfill their intended functions. A variety of methods are available to aid institutional synthesis, which may be applied in ways that create problems or aid in solving problems. Table 1 summarizes metaphors, methods. In brief, relevant concepts and methods include the following:

- *Building*: providing a range of alternative institutional mechanisms, such as the practices common in many locally managed irrigation systems, as a menu of

options for consideration, and as suitable standards for reference about what might be relevant and feasible.

- *Crafting*: Using diagnostic questions about key topics, such as those related to principles for institutional design, and applying systematic processes for diagnostic analysis to work towards solutions.
- *Bricolage*: Encouraging institutional improvisation, rather than insisting on complete information and comprehensive planning. Appreciating the strengths of current arrangements, and how those could be used to further enhance management.
- *Discourse*: Encouraging dialogue and reframing issues. Facilitating forums, platforms, networks and other ways of convening conversations, building trust, encouraging deliberation, and supporting shared decision-making.
- *Adaptation*: Choosing timing in relation to cycles of adaptation, and multiple sequences (pathways) of change.

Table 1. Alternative metaphors and methods<sup>1</sup>

METAPHORS	METHODS
<i>and alternative applications</i>	
<b>Building</b>	
<i>Fixed blue print/model vs. exploring design space</i>	<ul style="list-style-type: none"> <li>• Menus of institutional options</li> <li>• Solutions for social dilemmas</li> </ul>
<b>Crafting</b>	
<i>Unique, spontaneous vs. principles and patterns</i>	<ul style="list-style-type: none"> <li>• Diagnostic questions related to principles</li> <li>• Processes for problem-solving</li> </ul>
<b>Bricolage</b>	
<i>Get the institutions right vs. partial, contingent solutions</i>	<ul style="list-style-type: none"> <li>• Improvisation, incrementalism</li> <li>• Polycentric artisanship</li> </ul>
<b>Discourse</b>	
<i>One-way indoctrination vs. two-way dialogue</i>	<ul style="list-style-type: none"> <li>• Facilitating forums</li> <li>• Building trust</li> </ul>
<b>Adaptation</b>	
<i>Unilinear evolution vs. multilinear, cyclic, pulsed</i>	<ul style="list-style-type: none"> <li>• Finding paths</li> <li>• Timing and sequencing</li> </ul>

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<sup>1</sup> An earlier version of this table appeared in Bruns (2009).

## ENDNOTES

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<sup>1</sup> This paper is part of a project on “Designing Commons: Finding Better Ways to Share Water,” to be further explored as a Visiting Scholar 2009-2010 at the Workshop in Political Theory and Policy Analysis. This paper further develops ideas about metaphors and methods for institutional design discussed in “Institutional Design on the Edge of Chaos: Metaphors and Methods for Crafting Commons in Irrigation” (Bruns 2009).

<sup>2</sup> Characteristics that distinguish irrigation in northeast Thailand from the “spate” irrigation found in mountainous, arid areas, such as Pakistan (van Steenberg 1997) and Eritrea (Mehari, Schultz, and Depeweg 2005) include more rain during a longer wet season; more gradually changing (less flashy) streamflow; and gently sloping topography.

<sup>3</sup> Even in many large government-managed irrigation systems, variable supplies to tail end areas may create similar circumstances of uncertainty, particularly where the official area that is supposed to be irrigated substantially exceeds the area that receives reliable water delivery.

<sup>4</sup> Drawing on work in the Usangu Basin in Tanzania, Cleaver stresses the importance of more generalized patterns of reciprocity (F. Cleaver 2001).

<sup>5</sup> Lansing (Lansing 1991; 2006) analyzes networks of small irrigation systems in Bali as complex adaptive systems with emergent patterns of spontaneous order.

<sup>6</sup> Ideas about institutional bricolage have been developed by Cleaver and colleagues in a series of papers (Cleaver 2000; Cleaver 2003; Cleaver and Franks 2003) drawing on ideas about institutional bricolage from, among others, Mary Douglas (1987) and

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Claude Levi-Strauss (1966). The discussion in this paper concentrates on the 2003 paper, “How Institutions Elude Design,” which provides a systematic critique of issues involved in applying Ostrom’s institutional design principles to a case of river basin management in Tanzania.

## REFERENCES

- Alexander, C., S. Ishikawa, M. Silverstein, M. Jacobson, I. Fiksdahl-King, S. Angel, and Center for Environmental Structure. 1977. *A pattern language: towns, buildings, construction*. Oxford University Press New York.
- Alexander, Christopher. 1964. *Notes on the Synthesis of Form*. Harvard University Press, October 24.
- Biswas, A. K. 2004. Integrated water resources management: a reassessment. *Water International* 29, no. 2: 248-256.
- Blomquist, William. 1992. *Dividing the Waters: Governing Groundwater in Southern California*. San Francisco: Institute for Contemporary Studies.
- Boelens, Rutgerd, Axel Dourojeanni, Alfredo Duran, and Paul Hoogendam. 1998. Water Rights and Watersheds: Managing Multiple Water Uses and Strengthening Stakeholder Platforms. In *Searching for Equity: Conceptions of Justice and Equity in Peasant Irrigation*, ed. Rutgerd Boelens and Gloria Davila. Assen, Netherlands: Van Gorcum.
- Braun, Ann. 2005. Beyond the Problem-Solving Approach to Sustainable Rural Development. In *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management A Sourcebook*, ed. Julian Gonsalves, Thomas Becker, Ann Braun, Dindo Campilan, Hidelisa De Chavez, Elizabeth Fajber, Monica Kapiriri, Joy Rivaca-Caminade, and Ronnie Vernooy, 1: Understanding Participatory Research and Development:129-134. Laguna, Philippines; Ottawa, Canada: International Potato Center-Users' Perspectives With Agricultural Research and Development; International Development

Research Centre.

Bruns, Bryan. 1987. Invisible Irrigation: Water Management in Northeast Thailand.

*Farmer Managed Irrigation Systems Newsletter, International Irrigation*

*Management Institute, Sri Lanka*, no. 2: 13-15.

———. 1990. Design for Participation: Elephant Ears, Crocodile Teeth and Variable

Crest Weirs in Northeast Thailand. In *Design Issues in Farmer-Managed*

*Irrigation Systems. Proceedings of an International Workshop of the Farmer-*

*Managed Irrigation Systems Network held at Chiang Mai, Thailand from 12 to 15*

*December 1989*, ed. Robert Yoder and Juanita Thurston, 107-119. Colombo, Sri

Lanka: International Irrigation Management Institute.

———. 1991. The Stream the Tiger Leaped: A Study of Intervention and Innovation in

Small Scale Irrigation Development in Northeast Thailand. Cornell University.

Bruns, Bryan Randolph. 2008. Social Engineering or Participatory Problem-solving? A

Practitioner's Perspective on Opportunities for Irrigation Co-management. In .

Memphis, Tennessee, March 26.

Bruns, Bryan Randolph. 2009. Institutional Design on the Edge of Chaos Metaphors

and Methods for Crafting Commons in Irrigation. In . Santa Fe, New Mexico,

March 17.

Cleaver, F. 2000. Moral ecological rationality, institutions and the management of

common property resources. *Development and Change* 31, no. 2: 361-383.

———. 2001. Institutional Bricolage, Conflict and Cooperation in Usangu. *IDS Bulletin*

32, no. 4: 26-35.

———. 2003. Reinventing institutions: bricolage and the social embeddedness of

- natural resource management. *Securing land rights in Africa*: 11-30.
- Cleaver, Frances, and Tom Franks. 2003. How institutions elude design: river basin management and sustainable livelihoods. *Presented at The Alternative Water Forum*.
- Cooperrider, D. L., and S. Srivastva. 1987. Appreciative inquiry in organizational life. *Research in organizational change and development* 1: 129-169.
- Douglas, Mary. 1987. *How Institutions Think*. Law Book Co of Australasia, May.
- Fisher, Roger, William Ury, and Bruce Patton. 1991. *Getting to Yes: Negotiating Agreement Without Giving In*. New York: Penguin.
- Gunderson, Lance H, and C. S Holling. 2002. *Panarchy: Understanding Transformation in Human and Natural Systems*. Washington DC: Island Press.
- Hoshikawa, K., and S. Kobayashi. 2003. Study on structure and function of an earthen bund irrigation system in Northeast Thailand. *Paddy and Water Environment* 1, no. 4: 165-171.
- . 2009. Effects of topography on the construction and efficiency of earthen weirs for rice irrigation in Northeast Thailand. *Paddy and Water Environment* 7, no. 1: 17-25.
- International Institute for Sustainable Development (IISD). Appreciative Inquiry and Community Development | IISDnet. <http://www.iisd.org/ai/>.
- Korten, David C. 1980. Community Organization and Rural Development: A Learning Process Approach. *Public Administration Review* 40, no. 5: 480-510.
- Lam, Wai Fung. 1997. Institutional Design of Public Agencies and Coproduction: A Study of Irrigation Associations in Taiwan. In *State-Society Synergy: Government*

- and Social Capital in Development*, ed. Peter Evans, 11-47. Berkeley: University of California Press.
- Lankford, Bruce A., Douglas J. Merrey, Julien Cour, and Nick Hepworth. 2007. *From integrated to expedient: An adaptive framework for river basin management in developing countries*. International Water Management Institute.
- Lansing, J. Stephen. 1991. *Priests and Programmers: Technologies of Power in the Engineered Landscape of Bali*. Princeton: Princeton University Press.
- . 2006. *Perfect Order: Recognizing Complexity in Bali*. Princeton, NJ: Princeton University Press.
- Levi-Strauss, Claude. 1966. *The Savage Mind*. University of Chicago Press.
- Mehari, Abraham, Bart Schultz, and Herman Depeweg. 2005. Where Indigenous Water Management Practices Overcome Failures of Structures: The Wadi Laba Spate Irrigation System in Eritrea. *Irrigat* 54: 1-14. doi:10.1002/ird.15.
- Mollinga, Peter P, and Alex Bolding. 2005. *The Politics of Irrigation Reform Contested Policy Formulation and Implementation in Asia, Africa and Latin America*. Aldershot: Ashgate.
- Oakerson, Ronald J. 1999. *Governing local public economies : creating the civic metropolis*. Oakland, Calif: ICS Press.
- Ostrom, E. 2005. *Understanding institutional diversity*. Princeton, NJ: Princeton University Press.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Ed. Douglass C North. Cambridge: Cambridge University Press.

- . 1992. *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco: Institute for Contemporary Studies Press.
- . 2008. Design Principles of Robust Property-Rights Institutions: What Have We Learned? In . Cambridge: Lincoln Institute of Land Policy, June 2.
- Ostrom, Elinor, Marco A. Janssen, and John M. Anderies. 2007. Going beyond panaceas. *Proceedings of the National Academy of Sciences* 104, no. 39: 15176-15178. doi:10.1073/pnas.0701886104.
- Ostrom, V. 1980. Artisanry and artifact. *Public Administration Review*: 309-317.
- Pierson, P. 2004. *Politics in time: history, institutions, and social analysis*. Princeton University Press.
- Pierson, Paul. 2000. The Limits of Design: Explaining Institutional Origins and Change. *Governance* 13, no. 4: 475-499. doi:10.1111/0952-1895.00142.
- Rap, Edwin. 2006. The Success of a Policy Model: Irrigation Management Transfer in Mexico. *Journal of Development Studies* 42, no. 8: 1301 - 1324.
- Renault, D., and I. W Makin. 1999. Modernizing Irrigation Operations: Spatially Differentiated Resource Allocations. Working Paper.  
<http://dlc.dlib.indiana.edu/archive/00004107/>.
- Renault, Daniel, Thierry Facon, and Robina Wahaj. 2007. Modernizing Irrigation Management: The MASSCOTE Approach: Mapping System and Services for Canal Operation Techniques. *FAO Irrigation and Drainage Paper* 63.
- Repetto, Robert, ed. 2006. *Punctuated Equilibrium and the Dynamics of U.S. Environmental Policy*. New Haven: Yale University Press.
- Sabatier, Paul A, Chris Weible, and Jared Ficker. 2005. Eras of Water Management in

- the United States: Implications for Collaborative Watershed Approaches. In *Swimming Upstream: Collaborative Approaches to Watershed Management*, ed. Paul A Sabatier, Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock, 23-52. Cambridge, MA: MIT Press.
- Saleth, R. Maria, and Ariel Dinar. 2004. *The Institutional Economics of Water: A Cross-Country Analysis of Institutions and Performance*. Northhampton, Massachusetts: Edward Elgar and the World Bank.
- Schlager, E., and W. A. Blomquist. 2008. *Embracing watershed politics*. University Press of Colorado.
- Shivakumar, Sujai. 2005. *The Constitution of Development : Crafting Capabilities for Self-governance*. New York: Palgrave Macmillan.
- van Steenberg, F. 1997. Understanding the sociology of spate irrigation: cases from Balochistan. *Journal of Arid Environments* 35, no. 2: 349-365.
- Steins, Nathalie A, and Victoria M Edwards. 1998. Platforms for Collective Action in Multiple-Use CPRs. *Presented at Crossing Boundaries, the seventh annual conference of the International Association for the Study of Common Property*.
- Steward, J. H. 1972. *Theory of culture change: The methodology of multilineal evolution*. University of Illinois Press.
- Tang, Shui Yan. 1992. *Institutions and Collective Action: Self-Governance in Irrigation*. San Francisco: Institute for Contemporary Studies.
- Williamson, Oliver E. 1996. *The Mechanisms of Governance*. New York: Oxford University Press.