

# Urbanization and Water Development in the Pacific Islands

MAGNUS MOGLIA,  
PASCAL PEREZ AND  
STEWART BURN

*ABSTRACT* Many urban centres in the Pacific islands have witnessed rapid growth and considerable cultural transition. Despite well-meaning and considerable efforts to improve water service delivery, there usually remain very real concerns relating to the limited supply of freshwater and notoriously poor water quality. Many water developments fail due to lack of ownership and ultimately from naïve assumptions about the socio-cultural contexts in which solutions are applied. Owing to a range of inter-relations and socio-cultural considerations, water development under these circumstances is a complex task that typically cannot be approached in a simplistic manner. Magnus Moglia, Pascal Perez and Stewart Burn describe three archetypes for water development (techno-centric, micro-credit and companion modelling), but in the end identify the companion modelling approach as being more suitable for developing context-specific institutions. While this methodology is part of the preferred participatory approaches, applying it to a real-world context is not easy, and a number of lessons are described based on previous experiences in the atoll town of Tarawa.

*KEYWORDS* urbanization; modern world; Millennium Development Goals; gender; socio-cultural transition

## Introduction

With increasing and accelerating urbanization, meeting the need for adequate urban water management is a great challenge. This challenge is increasingly relevant for many Pacific island nations as islanders congregate in urban centres in search of urban services and the perceived opportunities of the modern world. However, when urban services and opportunities are not realized, the desperation and poverty in urban areas is sometimes overwhelming, often leading to crime and political frustration. In this context, despite promised commitments in the Millennium Development Goals to create universal access to safe water, efforts to provide urban water services often fail, leading to a range of social issues. In locations such as the small atoll town of Tarawa in the Republic of Kiribati, water services are patchy, unreliable and have considerable water quality concerns. As an indication of the severity of the problem, Tarawa has one of the highest infant mortality rates in the world.

## Development 51(1): Thematic Section

A recent United Nations report (United Nations, 2006) makes it clear that there has been surprisingly little progress in providing water and sanitation services to the world's poor. It also states that there are no single solutions that will solve the problem in isolation and that there are considerable barriers on the ground, in terms of involving local people and developing appropriate institutions. This is perhaps not so surprising, given that water issues, despite their apparent everyday nature, involve considerable complexity in terms of the associated socio-cultural aspects.

The socio-cultural complexity of urban water arises from a number of different facts:

*Water is an unusual economic good with many different uses* (Batten, 2007):

- water is renewable and fugitive, that is, water flows in a cycle, with little of the total water in storages;
- many water bodies are common pool resources from which it is difficult to exclude users; and
- water typically has a very high value-in-use (i.e. very useful) but a very low value-in-exchange (i.e. the price is low), sometimes making economic valuation and market mechanisms problematic.

Conflict situations often arise relating to:

- a. Allocation: during times of water constraints, water is often diverted from less profitable uses (often rural), and away from minority (or less powerful) groups,
- b. Upstream/downstream interactions: water can be removed or polluted upstream, leading to downstream reduced or polluted supply, requiring negotiation between upstream and downstream users.

Urban scale increases the need for collecting, storing and transporting water. This

- requires local organizational capacity for operation, maintenance and asset management;
- creates a service expectation and a loss in the sense of responsibility and ownership by increasingly distancing users from the water sources; and

- interferes with land resources that are sometimes scarce in themselves, and typically in private ownership.

Pressures for adequate environmental management for protection of water resources, often interfering with cultural practices such as agriculture, land clearing and burial grounds.

Water use is often informal, sometimes unconscious and always critical in households, with considerable differences between patterns of use, relating to

- Gender: male and female usage patterns are often distinctly different.
- Culture: often depending on customs, practices and traditions.
- Economic status: with distinct differences between wealthier and poorer segments of the community.

Most importantly, water is a critical foundation for urban settlements, and any complex society will have to deal with complexities of water (which in itself can be a driving force towards societal complexity). In fact, it is often found that water and culture are inter-twined, as exemplified in the social structures surrounding the Balinese water temples that coordinate irrigation among and between farming communities. The Balinese agricultural tradition entailed complex religious, social and technical processes that optimized water sharing on the Indonesian island, reduced pest infestations and successfully yielded rice and other food crops (Lansing, 1996).

Such socio-cultural arrangements are typically not the result of quickly implemented processes, but have most likely developed in stepwise processes over long periods of time. However, since the industrial revolution many dominantly rural societies have relocated into urban settlements, generating on-going pressures for rapid socio-technical transformation. The process has typically been one of adoption of existing types of institutions and technology rather than the development of solutions tailored to the local contexts. This is a risky strategy from at least two perspectives. The adopted strategy is potentially not suitable to local contexts, and this leads to a high risk of failure and high costs in retro-fitting

solution, and secondly, the impact of introducing new technology and practices into a socio-cultural context can potentially be wide ranging, as illustrated by the cascading impacts when steel axes were introduced into an Australian aboriginal society (Sharp, 1997). These in turn affect social networks and gender relations, and lead to the deterioration and eventual collapse of traditional ideas, sentiments and values, leading to apathy, cultural disintegration and demoralization.

In line with this, water developments can be perceived to be in the complex systems domain (Moglia *et al.*, 2007) and as such the Cynefin framework (Kurtz and Snowden, 2003) prescribes the following generic principles:

- Analysis of history as a means to understand systemic properties, but this is insufficient in itself as a complex system is evolutionary and dynamic,
- Exploratory analysis in order to temporarily move to a situation where cause and effect relationships are discoverable,
- Use of an adaptive approach, where interventions are designed as probes, and are analyzed in retrospect in order to understand how to promote desirable patterns of behaviour,
- Use of multiple perspectives on the nature of the system, because no single perspective is sufficient to fully understand it,
- Use of narrative techniques, as these are able to capture and convey complexities without necessarily being bound by formalism and simplifying assumptions.

### **Embedding solutions into the socio-cultural context**

It is clear based on the previous section that water developments need to consider a complex range of issues in design, planning and implementation. In fact, a given development needs to be (1) efficient, (2) practical, (3) well resourced, (4) environmentally sustainable and (5) embedded into the socio-cultural setting.

This needs to be done in acknowledgement that measures such as performance, acceptance and efficiency are dynamic and must be monitored and adaptively responded to on an ongoing basis.

In attempting to address how to embed solutions into the socio-cultural context, it has been recognized that participation by many different stakeholders is critical. The participatory method is supported by nearly every aid organization as well as organizations such as the United Nations and the World Bank, and the commonly cited Dublin statement is: 'Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels' (ICWE, 1992).

But what are participatory approaches? And why is participation a preferred process? The reasons are varied but such processes tend to generate ownership and allow for dealing with varying behaviours, cultures and values. It also tends to highlight practical concerns at an early stage by providing multiple reality checks before implementation, and perhaps most importantly, it allows for local people to create their own assumptions and institutions, using processes of social learning that will uncover aspects of their interactions that they would individually be unaware of. This is a means of fast-tracking the evolution of adequate institutions.

But a critical issue remains relating to the fact that participation is a poorly defined concept, because in terms of a development project, participation could mean almost anything. Cornwall and Jewkes (1995) make an important observation by asking the following question: 'If all research involves participation, what makes research participatory?' This leads them to list the following modes of participation as described by Biggs (1989):

- Contractual: people are contracted into the projects of researchers to take part in their enquiries or experiments,
- Consultative: people are asked for their opinions and consulted by researchers before interventions are made,
- Collaborative: researchers and local people work together on projects designed, initiated and managed by researchers,
- Collegiate: researchers and local people work together as colleagues with different skills to offer, in a process of mutual learning where local people have control over the process.

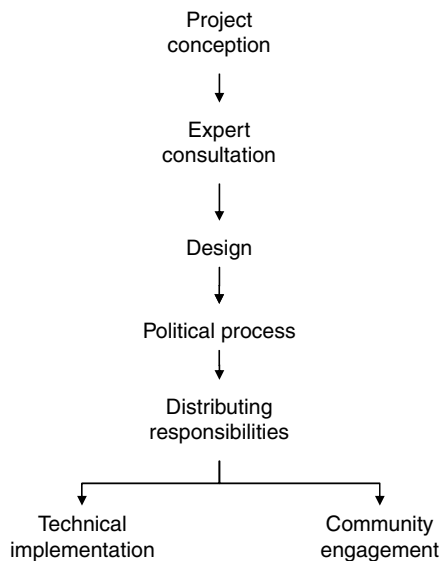
## Development 51(1): Thematic Section

It should also be noted that participation is not a silver bullet resolving all practical problems, and should not divert attention from critical components such as political, legal and market barriers (Botchway, 2001; Sundar, 2001; Eversole, 2003).

### Process archetypes

To illustrate what kinds of processes are available and have been tried, let us consider a number of archetypal processes for water development. Such processes vary in terms of the types of participation as well as in terms of the procedural filters that are being applied. Such procedural filters are often institutional facts based on collective expectations, and as such tend not to be questioned.

The first archetypal process (see Figure 1) is techno-centric in nature, with community engagement only at the end of the process. The political process before implementation is often a requirement in a political environment, while community engagement in this process usually consists of education and awareness programmes, or simply consists of telling the community what to expect.



52 Figure 1: Techno-centric archetype

The key danger of this sequential and expert-oriented process is that it lacks adaptive mechanisms, it relies on a naïve assumption about the socio-cultural environment and it does not sufficiently consider multiple perspectives. It is also noted that much of the good work that may be done in the earlier stages of the process may be undone as part of the political process, and this underlines the importance of efficient and transparent government. A typical failure mode related to the techno-centric archetype is lack of community ownership. However, if successful, the expert process tends to be efficient in finding financially and technically prudent solutions, but often does not consider the high risk of failure.

The second archetypal process (see Figure 2), the micro-credit process, is participatory and decentralized in nature, and in this way avoids the political process. It works by providing opportunities (such as by micro-credit or otherwise) for community individuals to provide services for themselves.

The advantages of this process archetype are an increased sense of ownership, and that it provides opportunities for the poorest in society, and hence complements other approaches by filling in the gaps where the existing system has blind spots (i.e. for community segments otherwise not reached). Disadvantages of this archetype is that it may lead to inadequate design, improper installation and, more frequently, inadequate maintenance (Crites and Tchobanoglous, 1998), potentially causing environmental problems, wasting vital funds and eroding goodwill.

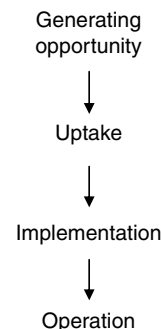


Figure 2: Micro-credit archetype

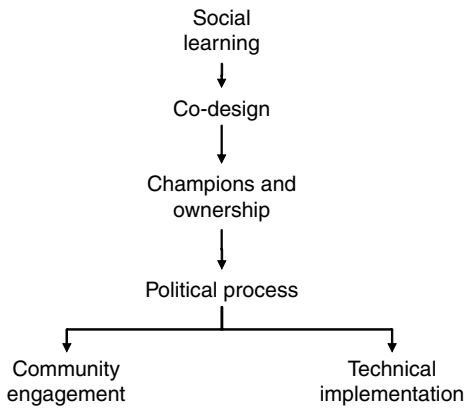


Figure 3: Companion modelling archetype followed by a traditional process of political acceptance and implementation

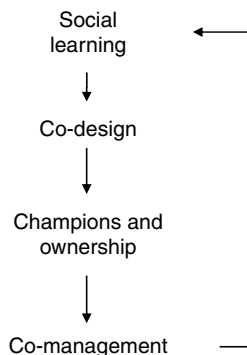


Figure 4: Ideal companion modelling archetype with adaptive feedback

A third type of process archetype (see Figures 3 and 4) is the companion modelling approach, which involves a completely different level of community participation by allowing for social learning and co-design that has the potential to fast-track the evolution of appropriate and context specific institutions, and in particular to develop co-management frameworks. The drawback of this process is that solutions still need to go through the political process, creating a risk of failure and dilution of the original design. This is also related to the difficulty of finding champions to ensure that the project is delivered.

It should also be noted that the cyclic nature of the companion modelling approach (see Figure 4)

needs to be honoured in order for this to be a truly adaptive approach. This requires the development of local facilitation skills as well as maintained modelling tools.

### Companion modelling experiences in the atoll town of Tarawa

Out of the described archetypes, the companion modelling process of social learning, co-design and taking ownership is the most promising in terms of fast-tracking the evolution of institutions. The companion modelling approach has been applied in Tarawa in the Republic of Kiribati within the AtollScape (Perez *et al.*, 2003) and AtollGame (Dray *et al.*, 2006, 2007) experiments. Despite preliminary successes in terms of social learning and co-designing stages, the final outcomes were negatively affected by the fact that: (i) key stakeholders (i.e. the water utility) did not take ownership of the negotiated outcomes and (ii) that political conflicts and rivalries caused a stalemate situation.

As a matter of fact, the situation in Tarawa is representative of a majority of countries in the Pacific where under-resourced administrations struggle to negotiate with traditionally ruled communities. Across the Pacific, Western world-born legislations have failed, so far, to subdue custodian rules. Hence, political realms play a key role in arbitrating between administrative duties and ancestral rights. Such processes are, by nature, obscure, subjective and prone to defiance. The AtollGame experiment showed that despite a series of sustainable solutions being collectively proposed during the companion modelling sessions, most participants representing government agencies did not have any mandate beyond the experiment (Dray *et al.*, 2006). Furthermore, the experiment demonstrated the schizophrenic position of these individuals, trapped between their cultural sensitivity and their professional rationality. Despised by their communities while endorsing their administrative role, they often end up enforcing hard-line strategies while managing water infrastructures. Unfortunately, this behaviour is encouraged by the project-funded nature of water infrastructure maintenance and

## Development 51(1): Thematic Section

rehabilitation in the Pacific region. As was the case in Tarawa, contracting arrangements, financial settlements and project milestones seldom provide opportunities to re-assess project objectives, and even less chances to genuinely engage with local communities (Dray *et al.*, 2007). It is only through an early and unconditional political support to participatory solutions that government officers might step out from their rigid roles and exchange with community leaders. Scarce human resources, erratic funding opportunities and high transaction costs in the Pacific plead for participatory and adaptive governance of water facilities. The AtollGame experiment provided a basis for co-management of water infrastructures between local communities and the government. Only a strong political determination would have: (i) sidelined extremists from both sides and (ii) provide incentives for government agencies to endorse the process.

### Conclusions

Water development in urban areas that are in socio-cultural transition is surprisingly complex, especially when there are limited human and financial resources. For such situations, an

approach is required that takes complexity into account and seeks multiple perspectives. Wide participation is a key ingredient of such an approach, but it has also been argued that participation is difficult to achieve, and often tends to under-prioritize other important aspects such as legal barriers, market barriers and technical issues.

In exploring the options for water development processes, three archetypical processes have been described: the techno-centric approach, the micro-credit approach and the companion modelling approach. While each has pros and cons, the companion modelling approach has been deemed more suitable in terms of the construction of context-specific institutions for water management. It is particularly suitable for locations that are in socio-cultural transition and where traditional approaches tend to fail.

However, based on experiences in the atoll town of Tarawa, it is argued that in urban water development, the companion modelling approach needs to honour its cyclic nature to ensure adaptive management. Also, in order to increase the effectiveness of the companion modelling approach, it needs to be linked to the political process as an integral part of the social learning and co-design processes.

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