WATER AND EMPLACEMENT: NEW PERSPECTIVES FROM DISPLACEMENT AND RESETTLEMENT TO ENHANCE IWRM PRACTICE

Report to the
Water Research Commission

by

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1. INTRODUCTION

This project seeks to apply concepts from the field of displacement and resettlement studies to develop a framework to understand, assess and respond constructively to the socio-economic, institutional, and ecological, i.e. social-ecological, impacts experienced by people in human settlements, and the options and constraints created, when they are affected by planned changes in access to water supply, quality and habitats. This includes not only the water supply impacts, but also the social consequences and the accompanying reactions that such planned changes evoke – not least because of the changes in infrastructure, environment and neighbourhoods, and thus, of social and economic circumstances, that such changes often bring with them. The intention is to apply this framework to help ensure viable and sustainable human settlement by contributing to the development of guidelines, and so, of sound practice, in relation to upholding water's positive emplacement role (see below) in human settlements. This will make a significant contribution to IWRM. Through developing this framework, the aim is to give direction to the design and implementation of i) future water related projects ii) the continuing water and human settlement policy process iii) socially and ethically sound water research practice iv) more social-ecologically related practice v) better overall implementation of IWRM. Inasmuch as the project provides fresh insights into conceptualising the integrating role of water in society, it will also feed directly into the WRC's major new Lighthouses initiative (see below), notably Water Sensitive Design. In applying concepts and insights from the field of displacement and resettlement to develop a framework to address the impact of change in the water sector, the project leader is bringing more than 30 years of experience in the fields of resettlement and development, and inter-disciplinary work, to this project.

Human settlement has a significant spatial/place-related aspect. Place, as a source of habitation and shelter, as well as a source of resources, relationships and meaning, undergirds and enables human settlement and society. People may be seen as settled, not only in a specific place, but in place as such, as socially and culturally 'emplaced'. 'Emplacement' is here taken to refer to an association and identification that a person or group of people has with a socially constituted place/territory. This association is recognised by others also associated with that place. Emplacement relates to being a member of the group or community associated with that place, with the concomitant rights and obligations of such membership, with regard to social relations and the institutional life of the group; this includes access to resources, livelihood, protection and meaning. Emplacement thus involves a socio-spatially constituted local citizenship (de Wet, 2008). Because the various aspects of collective human emplacement are interwoven in a dynamic, complex system, modification of any of these bases feeds back into, and works through, the on-going system of emplacement as a whole.

Water is fundamental to human settlement. In the same way that place, as a source of habitation and shelter, as well as a source of resources, relationships and meaning, undergirds and enables human settlement and society, so too does water undergird and enable human settlement and society. If we are to ensure viable and sustainable human settlement, it is necessary to understand water's foundational and emplacing role in relation to human settlement, and to develop guidelines for sound practice in that regard. This will make a substantive contribution to Integrated Water Resource Management (IWRM), which is a goal of this project. Water is central to human emplacement and to its viability. Apart from the fact that water is necessary to the sustenance of biota, it flows across human settlement and society in many and interrelated ways (e.g. social, economic, political, religious, health-wise, ecological). Water thus takes on a range of interlinked functions, and is central to the possibility and sustenance of human emplacement.

Interventions or projects which impact upon people's physical and social environment, notably in the form of infrastructure, impact upon emplacement and its viability, in a range of ways. Resettlement projects often significantly modify the spatial, social, economic, political, institutional and environmental bases upon which emplacement rests (Cernea, 2000; de Wet, 2006; Downing and Downing-Garcia, 2009; Scudder, 2005). Many interventions or projects alter access to and distribution of water, whether in terms of quantity, quality, or habitat, or in terms of the spatial and socio-political dimensions of that access and distribution. This influences what one might call 'the ways water flows across human society and settlements', and feeds back into the dynamics and sustainability of the complex system of human emplacement, in that particular context.

This project seeks to apply ideas from the field of displacement and resettlement studies, as a new perspective for helping us to understand the wider implications for settlement sustainability, of changes in water access and distribution, and of the social and policy implications of such changes. It is argued that the emplacement perspective provides a new and multidisciplinary approach to looking at the ways in which water plays a facilitating and diverse role in human settlements. Since water flows in many, diverse and multi-directional ways in relation to the social, institutional, political, economic and ecological needs of human settlement, it has a range of interrelated impacts. This cross-cutting and foundational role of water in relation to human settlements and their wellbeing has not always been adequately understood or incorporated in approaches to a wide range of water-focussed interventions. Looking through the list of projects which have been commissioned and completed by the Water Research Commission over the last decade and more, it is apparent that many of them have been very discipline-specific, and have correspondingly focused on the investigation of very specific relationships and limited notions of systems. It is here argued that applying insights from emplacement/dis-

emplacement and resettlement will enable us to bring out this multi-dimensional and integrating role of water in human settlements more clearly. This will assist us in opening out avenues of inquiry about ways in which water's 'emplacing' and foundational role in human settlements may be either impoverished/undercut or enhanced by poorly and narrowly, or by well-conceived and executed, undertakings.

This final report of project K8/1065 will investigate case studies of interventions or projects that have altered access to or distribution of water in settlement situations in South Africa and elsewhere in the world. The impact of such changes upon the ways in which water underscores and enables general human emplacement in specific areas or settlements will be documented and analysed. The intention is to understand the ways in which such alterations in the water regime impact upon human emplacement, and thereby, human socio-economic and ecological well-being. Bringing out differences in the ways in which this has happened, will help us to understand more clearly the ways in which alterations in the water regime relate to and impact upon human emplacement, and so enable these understandings to feed into the development of more informed and more responsible policy and better practice in IWRM.

Both resettlement projects and planned water change are complex institutional processes, which occur and unfold in stages, and which expose people to a range of risks and opportunities. To be successful and sustainable, they both need to be integrated into their wider administrative, political and economic context.

2. POSSIBLE LESSONS FROM RESETTLEMENT FOR IWRM

2.1 WHAT CAN WE LEARN FROM CASES OF SUCCESSFUL RESETTLEMENT?

The great majority of cases of forced group resettlement (typically, where people are moved to make way for a development project of some kind) can be regarded as failures, in the sense of having left the resettled people economically and socially worse-off than before, and often having had seriously negative environmental consequences.

Resettlement involves people being moved (usually not by choice) from where they have been living, to new areas which have been planned for them, or their being provided with money to move away and to find for themselves elsewhere. Resettlement thus involves imposed socio-spatial change. This involves changes in people's access to resources, and people who move to planned areas often find themselves with less arable and/or grazing land, smaller houses and housing sites, further from land, wood and water; if in urban areas, further from work and shops of choice, than before resettlement. Replacement of, or compensation for, resources left behind, is very often inadequate, so people find themselves with diminished resources. Resettlement usually draws people into larger and more socially diverse settlements, in which social groupings may become scattered. Resettlement takes place as a result of the intrusion of wider power and administrative structures into people's area and lives – which wider involvement usually results in diminished autonomy on the part of resettled people in the face of such larger structures. Resettled people thus often find themselves with diminished resources, social and economic networks, and autonomy – and become impoverished in a range of mutually reinforcing social and economic ways (Cernea, 2000). Resettlement is a complex institutional process, which is rarely adequately planned, funded, or implemented, and for which there are rarely the political will at the higher levels or the sufficiently skilled or committed staff on the ground to handle its challenges and complexities. (Scudder, 2005, Ch 3). For these inter-related reasons, the great majority of resettlement schemes world-wide have left the great majority of those people moved economically and socially worse-off than before.

Successful cases of resettlement are far fewer, and the reasons for their success would appear to be rather more case-specific than the more universal and more generic reasons for failure. Nevertheless, let us see what we can discern from such cases of successful resettlement, and what insights and principles we may be able to transfer to projects where we seek to transform patterns of water access, quality and distribution.

2.2 A CASE STUDY OF SUCCESSFUL DAM-RELATED RESETTLEMENT IN CHINA

It appears that successful income restoration is central to successful resettlement. As we shall see in the following two case studies (Shuikou and Arenal), sound planning is fundamental to such a positive scenario. Examination of a dam-related resettlement case in China (Shuikou)[1], shows us how sound resettlement policy and its proper implementation can result in successful, and even fairly swift, income restoration for the affected households, putting them back on their economic, and thus also, their social feet. (We must, however, be careful not to reduce successful social recovery after resettlement, to a function of successful economic recovery. We have been warned against this by Downing (1995) and by Oliver-Smith (2005)). In most cases at Shuikou, household incomes have increased significantly; the standard of both housing and services are better than before, and resettlers are satisfied with their situation after resettlement. What has led to this, in international terms, extremely unusual situation, and what lessons can we learn from it?

China has since the 1980s developed what is widely recognised as the most progressive set of resettlement policies in the world. However, policy is one thing, but faithful and effective implementation is another – as are the positive institutional and economic circumstances which enable such an implementation. In the case of Shuikou there was a clear commitment – and follow through – from government, at both national and local level, to guarantee the welfare of those who had to move. This was shown by:

- Comprehensive planning, combined with widespread participation, and all affected families having a direct input in decisions about their move and re-employment (although it is important to realize that not moving was never an option which was ever up for negotiation)
- Ongoing commitment by government to provide employment as the avenue of income restoration
- A high degree of flexibility in dealing with planning and budgetary problems

What is key to the success of the Shuikou project is its chronology. Notice the order in which things happen.

1. First, a resettlement plan is worked out after thorough consultation with town and village leaders.
2. Then the resettlement plan is approved.
3. Then the dam project is approved.

[1] The information for the material on Shuikou Dam and the related resettlement used in this section has been taken from Picciotto et al. (2001) *Involuntary Resettlement: Comparative Perspectives,* and specifically from Chapter 3: "Commitment to Economic Recovery in China".

4. Then the Shuikou Reservoir Resettlement Office is set up to manage the resettlement project.
5. Then – and only then – does dam construction start.

Effectively at the same time as dam construction starts, so does the relocation of the people. Over a space of the next four years, 70 percent of the people are moved – so things are not rushed. As the reservoir is filled, the final people are moved.

The resettlement plan being worked out before hand and the resettlement office being set up before dam construction, is now bearing fruit as people have clearly become productive immediately on arrival in the new area. Twenty thousand families (15,600 rural and 3,900 urban families – altogether 85,500 people) were moved, and within a year of the reservoir being filled, average household income levels surpass pre-resettlement levels! How did they do it?

The valley in which people were living was very narrow and steep, so all level land at the bottom was lost to the dam. If people were not to move far, this necessitated setting up new villages on newly made terraces or hilltops. But what to do for a living? Opportunities were provided via creative utilization of opportunities offered by the natural environment, as well as by the economic and administrative situation arising out of resettlement and in Eastern China more widely. These opportunities included:

- Orchard and tree farming on slopes too steep for cultivation
- Intensive farm activities, such as mushroom cultivation, poultry and pig raising, fisheries, pearl cultivation
- Service industries
- Small and medium enterprises
- Migration to urban areas, where job opportunities were available.

The resettlement program sought to bring small villages together into new towns, creating opportunities for new commercial developments and a rash of small ground floor shops in the residential complexes. "Successful resettlement requires management of major social change" (Picciotto, van Wicklin and Rice, 2001:43). One of China's strengths from the Communist era is that local government has a long history of planning and managing social change. There is thus a residual wealth of administrative and political expertise which is on hand to manage the complexities of something as demanding as resettlement, and local government played a vital, and facilitating, role in the planning and implementing of resettlement in Shuikou and in China more widely.

Not that there were not problems. Investments to establish new production systems were supposed to have been set in motion well before actual relocation. This intended

sequence however broke down. Confronted by funding shortages, the Resettlement Office and local government had to concentrate on infrastructure, such as roads, water supply, etc. to the cost of the development/production systems budget. So, e.g. planting of fruit trees fell behind schedule.

Problems notwithstanding, what stands out in the case of particularly Shuikou is the ongoing commitment on the part of the authorities to income restoration, and specifically, the provision of employment, as a central and non-negotiable target of resettlement. The goal has been to provide a job for each affected individual – and local government in China is specifically committed to this undertaking. In practice this has meant that each family would be provided with at least one job before other families received more than one job. This relates to the fact that China has resettlement policies at the national level which require implementational undertakings at lower administrative levels, and which make financial commitments to those lower levels (These commitments, however, became more tenuous in the era of neo-liberalism).

In agriculture, the notion of a job was measured in terms of a unit of land of specific size calculated to be able to produce a cash crop. Other available types of jobs include those mentioned before, such as: Additional farm activities, e.g. mushrooms, poultry, pigs, fish farming, pearl farming; services activities and commercial activities; and migration to larger urban areas.

People were allocated jobs in a very participatory way, choosing between already identified opportunities, with final allocations taking place through a lottery system for fairness. Cultivation ended up being able to provide significantly less jobs than initially planned for, and arrangements had to be made for many more off farm jobs than initially anticipated. A significant part of Shuikou's success lay in its ability to adapt in this regard: i.e. to move away from traditional agriculture, to town and village enterprises as a source of employment. The infrastructure necessary for these enterprises and jobs was funded from town and village finances, personal savings, outside investment, i.e. a range of sources, and involving personal as well as state commitment. Migration to the larger cities was the other major source of employment for resettlers – in this case by taking them out of the area. This was made possible by the rapid economic growth that had been taking place in the Eastern Seaboard area, enabling the absorption of Shuikou resettlers. This was a stroke of good fortune, rather than the fruit of careful planning on the part of the Shuikou resettlement officials.

Compensation was designed in such a way as to enable the resettlers to get back on their social as well as their economic feet. People were paid out cash for their old houses as well as being provided with access to replacement materials at subsidized prices. Villages

and townships were compensated for the loss of not only arable land, but also for community assets and infrastructure. This enabled reconstruction at both household and community level, with local government assuming responsibility for the rebuilding of community infrastructure. Improved access to services, coupled with rising incomes, has resulted in widespread resettler satisfaction with their post resettlement situation.

To what can we ascribe this positive situation?

Four important factors seem to stand out:

1. A positive national resettlement policy framework, which approaches resettlement – not as a situation where there is an obligation to compensate those who have been moved and to hope they find such compensation acceptable payment for their suffering – but rather as an opportunity for development, to improve the lives of those who have been relocated.
2. The resettlement authorities have – within the understanding that resettlement will happen (i.e. that resettlement itself is not negotiable) – been very consultative and participative with the local affected people, in terms of working out the specifics of their relocation. This has included considerable flexibility when particular job creation plans have not come to fruition.
3. All of these positive initiatives have of course required the necessary resources, in a range of ways: trained personnel, infrastructure, and of course, money. In these ways China has come up with the goods, although greatly assisted by having
    a. a local government bureaucracy trained and experienced from the days of communism
    b. on-going economic development on the Eastern Seaboard of China, which provided employment opportunities for a number of the resettlement-affected people of Shuikou.
4. In 1996 China created a "later stage Support Fund", whereby a proportion of the money obtained from power generation resulting from dams would be made available to provincial governments, to plow back into the further development of resettlement sites and improving resettlers' lives and livelihoods. So, resettlement was not seen as a once-off event, but as an ongoing process which required an ongoing commitment by the authorities to make it successful and to make that success sustainable.

The success of resettlement in the Shuikou case thus stems from a combination of positive factors in combination: i)good policy ii) good planning iii) an able bureaucracy to apply such policy and planning iv) the necessary political will – in significant measure because this was a high profile international project with World Bank funding, at a time when China was seeking respectability in international funding arenas v) sufficient

funding (both international and internal) – which allowed an ongoing investment in resettlement areas vi) and a safety valve, in the form of a vibrant Eastern seaboard economy, which soaked up resettlers that Shuikou as a project could not by itself take care of economically. We can see what the factors are that have led to resettlement being successful – at least in the first few years after people being moved. It does however, remain to be seen to what extent these factors will continue to be effective as the balance between national, regional and local contributions in relation to resettlement budgets continue to be renegotiated. It also remains a serious question to what extent the conditions operating in favour of successful resettlement in some parts of China are replicable elsewhere in China (by no means all resettlement projects in China are as successful as Shuikou) and elsewhere in the world.

Another dam-related resettlement project which has had successful outcomes (at least in the short term, as it does not appear to have been followed up over the longer term), is that of the resettlement of some 2500 people from the area where the Arenal Dam was constructed in Costa Rica (Partridge, 1993). It was a case characterized by forward planning well ahead of time, based on sound sociological research, and therefore on reliable data, with genuine participation by the to-be-affected people in the processes which would impact upon them. This meant that sound organizational capacity was built up early in the resettlement planning and implementation process – and sustained throughout it. While no implementation process is without its problems (in this case, the consequences of resettlement on the host population, and that the longer term social and environmental situation were not adequately taken account of), within seven years, the resettled population was economically and demographically settled and stable. They had been started out with traditional crops, and only then taken into the more risky areas of innovation and experimentation. once they had settled in and familiarized themselves with the new situation. Once again, we see the importance of careful forward planning and provisioning – and the central role of the participation of the affected people in their own resettlement trajectory, if there is to be successful resettlement.

Again the question: why success in this particular case? As one can best make sense of the case material, it seems to boil down to the openness and flexibility of the implementing agency, the Costa Rican Electrification Institute, which was prepared for the research, the preparation and the resettlement process to be done properly – unlike many agencies, which see resettlement as an obstacle to be gotten out of the way so that the ‘real tasks’ can be gotten on with.

2.3 SUCCESSFUL AND UNSUCCESSFUL RESETTLEMENT IN VILLAGIZATION SCHEMES IN SOUTH AFRICA

However, successful resettlement, in the sense of resettled people finding their feet economically again, may occur for reasons which seem to have nothing directly to do with resettlement and the way in which it is planned and implemented – but rather for reasons which have more to do with the wider political economy within which the actual resettlement project is situated. Let us briefly consider a kind of a resettlement of a much smaller scale, but of a much more widespread nature than that of dam-induced resettlement, viz. resettlement arising out of government – initiated villagization schemes. These have happened all over Africa, for a range of ideological-cum developmental reasons, and have been responsible for the resettlement of at least 25 million people across the continent during the twentieth century (de Wet and Fox, 2000:2).

We here wish to compare two villages situated within twenty kilometres of each other, in the Keiskammahoek magisterial district of the Eastern Cape of South Africa. In the period of the 1940s to the 1970s, the Keiskammahoek district was then reckoned to be part of the Ciskei homeland/bantustan, in terms of the then prevailing South African apartheid policy. These two settlements underwent villagization, i.e. movement from scattered residential clusters into larger, nucleated residential areas and more rigorously planned land use regimes within their own village territory, with the 'official' purposes, inter alia, of more effective land use and service provision – and, some analysts would argue, for more efficient control of the rural African population (e.g. Hendricks, 1990; Lodge, 1983:262; Yawitch, 1981: 19). The two villages were affected in significantly differently ways, because they had different land tenure systems. This meant that the policy of 'betterment planning' in terms of which villagization was being implemented, applied to them both, but in different ways. The policy applied *in toto* to one village (Chatha), with all its land being re-arranged, and all its people moved. The second village (Rabula), which had a range of different land tenure systems in it, such that the policy applied to only some parts of its land area, was affected very differently, and only some of its people had to move. This meant that the social impacts were significantly more far-reaching in the first village than in the second (de Wet and Leibbrandt, 1994).

Perhaps the most significant difference between these two villages both subjected to the same form of government-imposed villagization, has been the difference in the household income, as calculated in real terms, between 1948/50 (when regular, detailed household surveys were undertaken – Houghton and Walton, 1952: 105-106) and 1990 (when our researchers undertook detailed surveys (Leibrandt and Sperber, 1997: 113). Real household incomes in Chatha had risen by 169 per cent, while those in Rabula had risen

by 523 per cent. Various factors, such as rises in the real value of wages in the mining and manufacturing sectors in the 1970s, the introduction of old age pensions for Africans in the rural areas in 1965, and the development of the Border-Ciskei economy (de Wet and Leibbrandt, 1994: 169) had served to boost incomes in the area generally. But why the significant disparity between Chatha and Rabula? In a word: relative locality – a factor which will also be of importance to the viability of water projects in the future.

Chatha is a remote village, tucked up against the Amatole mountains, on the furthest side of the Keiskammahoek magisterial district, accessible only by 16 kms of poor road from Keiskammahoek town. Rabula, on the other hand, is on the road that links the town of Keiskammahoek to the outside world, to the world of schools and churches and to the town that from the 1850s onwards was the administrative capital of the Ciskei administrative area in its various political guises: King William's Town. People from Rabula have always been better educated than their counterparts in Chatha, who have accordingly taken the lesser-skilled, and long distance migrant labour jobs in the mines in Johannesburg,(1000 kms away) or in the dairies in Cape Town (900 kms away). The better-educated people from Rabula have been able to become clerks and teachers – and to take advantage of the new range of civil service jobs on offer when the Ciskei homeland bureaucracy was launched in the 1970s. With bus rides of less than an hour (especially when the road to Keiskammahoek became tarred in the 1980s), such white-collar workers could now come home every day, as commuters, with their pay packets and their shopping, rather than as migrant labourers with their two homes and their uncertain commitments and remittances. Locality had historically placed the people of Rabula at an educational, employment and financial advantage over the people of Chatha when villagization hit the two places, and locality has continued to favour the post resettlement trajectory of Rabula relative to that of Chatha.

The important point about the contrasting fortunes of these two villages which have been subjected to the same broad government project, involving involuntary resettlement, is that – while resettlement and development plans and forces set changes and processes in motion, which are themselves powerful – the ways that these changes and processes play themselves out, are significantly influenced by factors other than resettlement itself. We need to take the wider socio-economic context within which local level resettlement takes place, into account. In that sense, resettlement is part of a wider system. In this case, the two villages were part of a wider regional system of risks and opportunities, which revolved centrally around differential accessibility to the world of learning and culture, access to health facilities and employment opportunities. The particular ways in which people are exposed to the risks that Cernea sees as inherent in resettlement and the opportunities to invert them into development options, are significantly related to the ongoing wider process of struggle between impoverishment and improvement that

characterizes the lives of so many rural people – and where they happen to be in that dynamic at a particular moment of their family life cycle (Sharp, 1982). Any intervention involving dis-emplacement – whether actual physical dis-emplacement, or in relation to regular access to resources such as clean or regular water and the relationships that flow together with that regular access – brings with it a series of impoverishment risks. To which different people are differently situated and exposed – and hence, at differential risk of impoverishment.

2.4 WHAT CAN WE LEARN FROM INSTANCES OF VOLUNTARY RESETTLEMENT?

Shuikou is by all accounts exceptional in its approach and performance as an involuntary resettlement project, as we find when we embark on a consideration of whether a review of voluntary resettlement projects has anything to offer our understanding of and approach to the impact of water access projects upon human emplacement. Eriksen undertook a systematic comparison of voluntary and involuntary resettlement schemes across the world that involved pairs of projects in five countries, that "had to take place in the same country, during approximately the same period,…had to have resettlement components that focused on restoring families' incomes by installing identical or very similar sets of agricultural enterprises"(Eriksen, 1999: 84).The "greater success of the voluntary resettlement programs" (Eriksen, 1999: 87) seems attributable to a range of factors, which suggests that the planners and implementers of these voluntary schemes understood the integrated nature of the context in which an intervention takes place. Therefore, unless the spatial, the social, the political and the economic are all taken into account together, in a flexible, open-ended manner, so as to allow for the complexities of the process involved, the intervention/resettlement will not end up as a success, i.e. leaving people better-off and socially stable. Central to the greater success of voluntary resettlement schemes, is that they are voluntary. This means that the settlement schemes are the focal activity, and not – as with involuntary resettlement schemes which have to happen to get people "out of the way of development" – a byproduct of something that is seen as more important, like the dam or the multi-lane highway. The people actively choosing to come to the new place, i.e. resettling, is what is going to make the desired activity, such as an agricultural scheme, possible. So, everybody, in principle, wants the settlement scheme to work, both as a settlement scheme, and as an economic catalyst. Those who join are self-selected and committed. The project-initiators are likely to be committed to agriculture as a primary goal, not as a secondary spin-off resulting from the need to feed a "liability constituency", i.e. those who we are obliged to look after because their moving made the dam possible. The resettlement components of the (voluntary agricultural) project are therefore treated as a central part of what is to become a long term regional process, i.e. developing agriculture for its own sake (Eriksen, 1999: 86).

So, the base line surveys and planning are properly done, cost projections are usually more accurate – not least because actual numbers are better known, because participants are willing and carefully selected. Various farm models are considered, resettlement areas are well planned and implemented, care is taken to provide appropriate infrastructure, and the risks confronting farmers are anticipated and taken into account (Eriksen, 1999: 96-116). Here, it would seem, we have an active attempt to apply something like Cernea's Risks and Reconstruction model (Cernea, 2000), where the risks facing farmers are anticipated, so as to be able to invert the risks into opportunities.

What lessons can we learn from the domain of resettlement, and the ways in which it impacts upon human emplacement and settlement, that we can apply to the field of interventions in water supply, quality and management, such that we can uphold water's central role in society? Involuntary group resettlement undercuts the physical, material and social bases of human emplacement. Because of the complexities involved in moving people as groups and because of the inter-related kinds of shortages of resources, skills, political will and time at the disposal of those planning and implementing resettlement, it usually lands up limiting not only material things like space, land and money, but also human options. Unless resettlement is very carefully planned, approached, dialogued and implemented – consciously being seen as a complex, open-ended process with something of a life of its own, which requires a confidant but consultative team approach in management – resettlement projects are likely to become repeats of the many disasters of the past. Cases like Shuikou and Arenal do, however, show us that there can be another way/other ways.

3.SOCIAL AND GENDER ASPECTS OF CHANGING PATTERNS OF WATER ACCESS

In this section, we will consider the social and gender aspects of changing patterns of water access, through examining some case studies from South-East Asia and from South Africa.

Case Study: An Integrated Assessment of the Environmental Flow Requirements of a River in India (Lokgariwar et al., 2013)

In a truly pioneering study, Lokgariwar and his colleagues have incorporated what they call the 'cultural flow requirements' of the river in their attempt to conduct an Environmental Flow Assessment of the Upper Ganga/Ganges River in India. Their argument is that "Ecological and community water needs are inherently linked", and that "rivers support the quality and 'way of life'" of multitudes of people associated with a river (Lokgariwar et al., 2013: 1). People's practices are harmonised with the natural cycles of the river, and their "ability to practice such rituals (e.g. ceremonial bathing) depends on the availability of certain flows at different times of the year" (Lokgariwar et al., 2013:2). If officials who are responsible for the management of the flow of the river are wanting to do so in a socially responsive and responsible manner, then what Lokgariwar and colleagues (2013:2) refer to as the "quantification of cultural flows", becomes important, i.e. how the timing of ceremonial practices relates to specific levels of the water, to the strength of flow, with certain aspects of the river being visible or accessible, etc. It needs to be determined whether the culturally acceptable flow regime of the river is compatible with what is regarded as an ecologically acceptable flow regime. The research was done explicitly to ascertain the cultural flow requirements of the Upper Ganga from people who utilize it for cultural/religious purposes. It was found that these cultural requirements in fact matched fairly closely with "those required for the maintenance of the biota and natural processes" (Lokgariwar et al., 2013: 15). While one does not have to take a projectionist or eco-determinist view of religion to find such a congruence unsurprising, this congruence, and the way in which it was obtained, is good news for the policy debate around rivers such as the Ganges and other rivers in Asia, which are under environmental threat. Government and environmental NGOs do not see eye to eye on environmental issues, and if administrators and river dwellers are to find one another on river management and flow requirements, then they need a set of measures for the "quantification of cultural flows" – as well as of biotic flows – that they can both trust. The process put forward in this study is a start in providing a common language and an attempt to bridge the spiritual/statistical gap in a way that enables greater dialogue and genuine participation in water management (Lokgariwar et al., 2013: 15).

This is integrated analysis at its best, and may hold lessons for water management that are applicable beyond South-East Asia.

But how do we manage issues of inequality around access to water? I (as a resident, but always temporary, 'participant observer' – but always middle class researcher) have often watched women balancing buckets of water on their heads, arching and curving their backs, in a grotesque kind of ballet dance, as they wind their way up the steep hill from the river in the poor rural settlement of Chatha in the Eastern Cape where I have cumulatively done some four years of onsite research since 1978. Then, thirsty from the walk up the hill, I have gone back to my room and turned the valve on my water container to pour myself some clean water to drink – uncomfortable about how easy this was. I have also watched men using donkeys as beasts of burden to carry containers of water to sell to the elderly who were no longer able to go down to the river when the pipes for the new water system that brought taps to the streets were broken by a grader repairing the streets – and were not fixed for some three years.

If we all lived in comfortable, functional, middle class lives and houses, where clean and plentiful water always came out when we switched on the tap, such examples would not be relevant. For many people, clean and plentiful water does not always come out when the tap is switched on (as in the example above, because the piping system is broken) – maybe, because in many places (as we shall see), there are not even taps, or because when such clean and water is available, this does not circulate in the same way to everybody in the affected settlement.

Water undergirds and enables human settlement and society, and flows across human settlement and society in many and interrelated ways. However, it does not flow in such a manner as to bestow its benefits equally upon everybody in society; and one of the major lines of cleavage along which water flows unequally, is that of gender. Why should that be the case? Whatever the wider political, economic and administrative systems in terms of which water is stored, treated and distributed, water ends up passing through household units, for human beings to use it for drinking, washing and cooking, or for the production of food or the care of their livestock. The way in which water passes down the system to the household level, is not arbitrary, but is a culturally very specifically managed process, in terms of a division of labour. It is usually women who are the cultural agents who are responsible for bringing water into the household and for working with it for the benefit of the household, as in fetching water, using it for cooking, laundry, etc. In the domestic sphere, water-related activities have been seen as a female domain in most societies, although its benefits flow uphill, gender-wise.

Water is thus a gender-politically informed domain, with women at the interface of moving water between the public sphere (which is usually male-controlled) and the private, domestic sphere (where women are responsible for it and for the labour involved in connection with water). When there are planned changes with regard to water supply, quality or habitat, the dynamic of this public/domestic interface, and therefore of the gender dynamics around water, will be affected. In this regard, water interventions (projects) are political in nature (Swyngedouw, 2009: 57).

Let us now look at some projects which have involved a change in water access and their impact upon the gender-water dynamic. We start with two studies from South Africa.

Case Study: Rainwater Harvesting and Conservation Practices in Selected Peri-Urban and Rural Communities in South Africa. (Viljoen et al., 2012). This project considered several peri-urban communities in the Free State Province and a rural community in the Eastern Cape Province. Rainwater harvesting techniques had been introduced by the Agricultural Research Council, with a number of households in the Eastern Cape village practicing deep trench gardening. Households using rainwater harvesting report an increase in the production of crops in their gardens, with some earning some money from the sale of the increased produce (Viljoen et al., 2012: v). However, gardens and agriculture make only a supplementary, rather than a significant, contribution to household food and income (Viljoen et al., 2012: 146), with the main participants in rainwater harvesting related cultivation being older people, and particularly women. This project, which has engaged about 30 per cent of households in the sampled villages (which does not mean that these households were not cultivating their gardens before rainwater harvesting was introduced) has therefore not impacted in any significant way upon the generational or gender based patterns of garden cultivation in these villages. It may also not have an extended life, as the youth do not show an interest in cultivation, and as people struggle to afford to keep buying the necessary seed, pesticides, etc. to accompany the rainwater harvesting initiative, and are starting to discontinue rainwater harvesting-related cultivation (Viljoen et al., 2012: 147) – presumably because it affords insufficient returns. Water – as in increased water access – by itself is not the magic bullet, even in a country such as South Africa, in which two-thirds of the surface area receives less than 500 mm of rain per year.

Case Study: Women in Rural Villages and the Water for Growth and Development Framework (Loate et al., 2012). This project considers the multiple water use strategies of women in two rural villages in Limpopo Province, South Africa. The context against which such multiple water use strategies emerged, was the existing water policy and implementation situation, and how it affected women involved in "productive water uses" such as cultivation (Loate et al., 2012: v). The Water Service Authority (WSA) supplied

water strictly for domestic use, while the Department of Agriculture (DoA) had a canal which provided water for its irrigation projects which went through the area. Women from the two villages thus did not have access to water – from either the WSA or the DoA – for their own productive activities. So, women exercised their agency, and "resorted to using water intended for domestic purposes as well as canal water strictly meant for projects under the DoA's auspices for their own productive purposes" (Loate et al., 2012:v).

Problems arose with repeated cut-offs of domestic water which seemed attributable, inter alia, to problems in the interrelationship between various local water and administrative agencies (Loate et al., 20112: v). These ongoing water cuts resulted in women and their various organisations developing a multiple water use strategy, using water sources for uses other than the single purpose (i.e. domestic use or DoA irrigation projects) for which they were officially intended. (Loate et al., 20112: 44-45). 'Domestic' water was used for domestic as well as productive purposes, and canal water was (illegally) used – also for domestic and productive purposes. This practical adaptation to the ongoing and unpredictable water cuts, however, had an unexpected consequence – as with most changes and adaptations in relation to access to water, it did not affect everybody equally. Some people were located closer to the canal than others, and this meant that some were better placed and able to continue with their daily domestic and economic cycle of activities than others. Location in relation to the canal, in combination with water cuts, thus made for inequality at a daily level. (Loate et al., 20112:44-45). Interventions on the part of the authorities in relation to water supply – both in terms of the water cuts and in terms of the irrigation canal – clearly did not take into account the social context in which those interventions would take effect, or the complexity of the integrated role of water in society.

We now consider two cases from South-East Asia, one from Bangladesh, and one from India.

Case Study: Gender, Class and Access to Water in Bangladesh (Crow and Sultana, 2002)
As mentioned above, in much of the 'South', access to water and the 'work of water' do not take place along lines of equality, but with various kinds of inequality reinforcing each other. This is particularly the case in rural societies in south-east Asia, where inequalities of status, wealth and land ownership are a legacy of the caste-system in strongly hierarchical societies, in which there is also a significant gender division. "Gender and material inequalities intersect to influence water deprivation and water security" (Crow and Sultana, 2002: 710). It is the women and children who perform the work in relation to the accessing of water, and women who are "the main managers of water for domestic purposes" (Crow and Sultana, 2002: 714). However, if women are not

equal to men, neither are all women equal to each other. Wealthier households own deep tube wells, which provide access to clean water, and women from wealthier homes have access to clean water more readily than poor women, and private tube well owners can charge a fee for use of their well (Crow and Sultana, 2002: 715). Public tube wells may be out of order or poorly maintained, with the poor dependent upon the rich for access to clean water. Poor women thus depend upon wealthier women for access to water.

A major water-related technology in South Asia has been the Green Revolution, with its aspect of irrigation through privately owned pumping of groundwater. However, the Green Revolution and its tube well aspect has had a significant gender dynamic, i.e. increasing male control over water, with men – who have control over property rights – obtaining charge over tubular wells and water markets related to them. (Crow and Sultana, 2002: 716-717). Irrigation has thus directed the benefits of water towards wealthier households and men (Crow and Sultana, 2002:717).

Tubular wells have had an unexpected effect in Bangladesh, again with a distinctive gender outcome. There is arsenic in the groundwater of the Bengal area, both of Bangladesh and of the Indian state of West Bengal – which is contaminating tube wells in 59 out of 64 districts in Bangladesh (Crow and Sultana, 2002: 2002: 718). Rural households now need to decide whether to use river or pond water – and risk water-borne diseases – or to use groundwater – and risk slow arsenic poisoning (Crow and Sultana, 2002:719). Wealthier households, that dig deeper tube wells, are able to access uncontaminated water, with poorer households having to compete for access to clean water, and with young women from arsenic-affected areas being seen as less marriageable (Crow and Sultana, 2002: 720).

A new technique of agricultural production, i.e. tube-well based irrigation, has thus had a range of unanticipated social and economic outcomes which feed into the existing set of material and social inequalities and into the existing gender dynamics. Once again, planned changes in the water supply and quality did not take into account the socio-economic context in which these changes would be implemented, or the complexities and the integrated nature of that context.

Case Study: Gender and State-Sponsored Water Supply in Gujarat, India (Mehta, 2005). As in Bangladesh, so in village Gujarat, water matters are deeply intertwined with cosmology and caste matters, and "water is used as a metaphor to accentuate differences and social distance between the groups in the village"(Mehta, 2005: 139). Water is/used to be fetched from three wells in the village, with water management at a formal level being a male preserve, and the fetching of and working with water being done by women. The workload carried by women and (in Mehta's analysis) the inequalities this involves,

are part of what Bourdieu would call "the universe of the un-discussed" or taken-for – granted, of the local political economy (Mehta, 2005: 169), i.e. not part of the conscious world of the average man or woman.

Since the 1990s, the Gujarat government has taken responsibility for the provision of water to a large number of villages in the Kutch area of Gujarat, which have developed water access problems of various kinds (Mehta, 2005:170). These have included, firstly: supply through a pipeline from a groundwater source some 40kms away to a tank in the village; and, secondly, when the pipeline scheme was discontinued: supply of water by tanker. However, there were supposed to be two principles according to which this state-initiated and sponsored water supply was supposed to work. Firstly, if India is a constitutional democracy, then it is supposed to operate on the principle of the equality of all of its citizens, and not according to village cosmology, which is based on differentiation/stratification of various intersecting kinds. Everybody should have the same rights to collect water – regardless of background, wealth or gender (Mehta, 2005: 170). Secondly, if the state changes the way of providing access to water, then it needs to maintain that new way in an efficient, sustainable and fair manner.

The village Mehta discusses was at the end of the 40 km pipeline. The pipeline was not effectively maintained, and there were shortages and fights for water when it (eventually) got to the village tank. Upper caste men usually won control of the tank, with lower caste individuals having to wait until last. The top of the tank was also too high for women to climb onto. They had to wait for the conventional access to the tank via the tap – by which time there was little, if any, water left (Mehta, 2005:171).

When the pipeline was discontinued, government started to truck water in by tanker and pour it into one of the wells for everybody to access. Again, the system did not operate as it was supposed to. Trucks did not arrive three times a day, as undertaken, with drivers being bribed to deliver the water elsewhere. So, the village received less water than it was supposed to. When the truck arrived and the water was poured down the well, it was again a case of first come first served. What counted was "strength and agility....it was not uncommon to see women at noon scraping the bottom of the well with their tumblers in the hope of getting the last drop" (Mehta, 2005: 172).

What do these examples show us? That water flows in the context of an integrated network of social relationships, to which it gives expression – and that these social relationships are fundamentally unequal. In that sense, water flows socially uphill. Fundamental to human social interaction and to human emplacement in society, is the phenomenon of gender, and the ways in which water flows, gives expression to gender dynamics in a society. To seek to alter access to, or interaction, around water, is to

influence the gender dynamics of a society, and thus, one of the bases of its emplacement. Any implementation agency that does not understand the integral link between water and gender, or the wider social contexts within which water flows, is going to set unintended consequences in motion, which may be counter to the goals of the project, but which may also be damaging to many people and to what they hold to be valuable – about water and more widely. Water managers need to have a keen understanding of the social spaces within which they are operating, and of the ways in which water flows within those spaces.

4.POLICY ISSUES AND MANAGEMENT OF WATER-RELATED PROJECTS

It seems appropriate to discuss policy and management issues in relation to water together – not least because a seasoned observer of policy dynamics such as Alan Rew (1995, Rew et al., 2006) has coined the term 'policy practice' to bring out the point that policy and its implementation should not be regarded as two separate things, or even as two separate phases of one process, with 'implementation' following after 'policy' which remains in some strange way pure and undefiled by what follows after its formulation. Policy and implementation should rather be understood as part of a single process, with policy substantially transformed in the process of its being implemented. A policy – such as any of the key water policies or laws in post-democratic South Africa – is a negotiated instrument, which has to be able to accommodate the concerns and interests of various groupings. It therefore needs to be general enough to make such accommodations. To take on life, it then has to be implemented – and that often involves contexts characterized by a lack of resources, a shortage of skills and poor communication. The policy, or the act/law, effectively becomes what local level water officials, hampered by a range of critical shortages, are able to make of it on the ground.

This is where management takes centre stage. The difference between municipalities that are functioning, and those that are not, between those with readily available water, and those without, can in significant measure be traced to those with or without effective managers. Clifford-Holmes has for the last few years been tracing the (literal) flow of water through the canals and houses of the Lower Sundays River Municipality and seeking to relate it to the policy and management dynamics of the area. (Clifford-Holmes, 2015). The way/s water is managed relate directly to how it flows through society, to how it is accessed and by whom, how it is treated and distributed, and consumed. Water management is thus directly related to the way a society is emplaced and operates. Both water policy and management need to be oriented towards this.

Why water projects in the first place? While some projects might be concerned more directly with the preservation of the natural environment, the majority of projects seeking to change the course or the concentration or the quality of water – and then to manage those changes – are concerned to do so for human benefit. The objective of water management "is not water management for its own sake, but water management to support sustainable development" (Lenton and Muller, 2009: 3). Management is crucial to achieving these broader development goals, as is seen in the differential ability of countries to manage levels of water variability. Without a predictable water supply, economic development is not viable (Lenton and Muller, 2009: 3).

In the same way as resettlement scholars and practitioners struggled to work their insights about the complexities and difficulties of forced group relocation and the possibilities of improving things for those who have to move to make development possible, into the thinking and practice of development agencies – in the same way those seeking to bring about integrated water resource management have struggled to get their message across. The very idea of integrated WRM is a change-charged idea and approach, in a context which has been largely characterized by silo thinking, both in terms of task definition, team formation and of fund allocation. Most change is slow and cumulative and many of its consequences in many ways unintended. (Did we foresee the structure of modern cities turning out the way they have when the car, or concrete, or chlorination, were invented?) As Lenton and Muller (2009:11) argue: "Deliberate change, (as opposed to passive processes of evolution) is inherently difficult to achieve."

I would suggest that there is something doubly difficult in this regard for IWRM. Not only does water flow through society in a range of ways, such that it is virtually impossible to keep track – let alone control – of all of them. (As I have suggested in the discussion on gender and social aspects of water, water can be seen to flow socially uphill – something the hydrologists might not care too much for!). One could even argue that setting off change is potentially anti-integrationist in nature. This is because change challenges the way in which things had previously stood in relation to each other, throwing old combinations out of the window and opening out the possibility of new ones. So, IWRM should perhaps best be seen, not as an integrationist blueprint to which all aspects of water resource management must conform – like some post resettlement outside-imposed development plan to which the resettled village must conform, regardless of any other opportunities that may come their way. Given that water flows through society in a range of ways, such that it is necessary to a range of different types of behaviours and contexts – then water management must be organized in such a way that it ensures the provision of water for all of those kinds of behaviours and situations. Water management must be open and oriented to the multi-facetedness, and complexity of the ways in which water underscores human settlement. "The imperative is to ensure that the ecological, social, economic, technological, political and institutional environments are considered…. understanding complexity is essential for the successful governance of aquatic ecosystems" (Pollard et al., 2011: 2). It is in that sense, of being open, and able to facilitate adjustment to changing circumstances (Lenton and Muller, 2009: 216) that water management is or should be integrationist.

It should also be integrationist in the wider sense, of linking the particular water project with which it is concerned, to its wider water management and political and economic context (Lenton and Muller, 2009:4). This resonates with Scudder's concern that a resettlement scheme cannot become self-sufficient if it is not planned to be able to

maintain its own regional administrative, economic and political relationships.(Scudder-Personal communication)

Integrated water resources management is a complex system. Water management is not complex only because of the large number of different types of behaviours and contexts through which water flows and has influence – if that were all that were involved, one could see water as more of a complicated good, and managing water as more of a complicated process. However, as the examples we have considered show, it is not only the diversity of the components of a system, but the nature of their interconnectedness that makes the system complex. IWRM is a complex system because it is characterized by the interconnectedness of the parts of the system, by non-linearity, feedback processes, and by emergence. Pollard and her colleagues therefore caution us that "understanding complexity is essential for the successful governance of aquatic ecosystems" (Pollard et al., 2011: 2). This means that we need to see the world as an open, dynamic system, in which change is part of the ongoing reality with which we have to deal as part of the 'management menu'. This requires that we have to be oriented towards change and to be able to design appropriate responses (Pollard et al., 2011: 26), while yet maintaining the broad overall vision and purpose of the management exercise – which is to bring about or maintain a broadly predictable and repeatable set of conditions with regard to a body of water, its quality, distribution and consumption. So, water resource systems, while clearly complex systems, clearly cannot be infinitely complex, infinitely open and infinitely open to change. Otherwise we clearly would not be able to manage them. Where do we go from here?

With resettlement schemes, initial plans and spatial transformations of the environment, such as the layout of new resettlement areas with houses, structures and fields, do to a considerable degree lay down a sort of "initial conditions," and create a sort of path dependence, which means that post-relocation options are not wide-open to whatever may come along. It is in this sense that Scudder is able to discern broad stages in the resettlement process, and Cernea is able to delineate risks, and conditions under which these risks can be turned into opportunities. However, that does not mean that the future is set down in stone. People are active agents, often reading more than one set of possibilities into an outside imposed intervention, seeking to turn situations to their benefit. Let us consider such an example.

The rural settlement of Chatha in the former homeland of the Ciskei in South Africa (which we have considered above) was moved by the government rural project of betterment in the 1960s. This involved the area being demarcated into newly laid out residential, arable and grazing areas, with everybody having to move within their rural settlement area into two new demarcated residential areas. Their new fields were much

smaller than their old fields, which were regarded as unsuitable for cultivation. The consequences of this move were documented in detail by de Wet for his doctorate (de Wet (1985) and later for a book (de Wet (1995). After democracy, an NGO used de Wet's detailed material to launch a successful restitution type claim on behalf of the settlement. An amount of R31 697.00 was awarded to each of the 334 families who moved in the 1960s – with the proviso that each family would be paid out half in cash and the other half would go into a community development fund. No sooner had the cheques been paid in December 2000, than the community split on what should be done with the other half. One group went along with government's suggestion/order that the money go into community projects, while another section, led by the former headman, launched a movement that all the money should be paid back to the claimant families. This difference went on for several years, seeing attempts to block community projects, violence, people in hospital and jail, and suggestions of splits along party political lines (de Wet and Mgujulwa, 2010). The restitution settlement had opened out new options, to which different politicians and groupings responded in different ways.

While path dependencies with regard to water supply and management are in significant ways limited by the physical infrastructure which supplies water, the ways in which such infrastructure operates or is accessed, is not laid down in stone. As we have recently seen in different parts of South Africa, sometimes the water supply system works better than at other times, and in some places it does not work at all for significant periods of time. People are therefore exposed to a range of different risks and opportunities by the ways in which the water resources system operates – not only by the introduction-cum-imposition of a new water supply or billing system, but also by the sudden non-functionality of such systems, with all the knock-on effects involved. However, people do not passively accept a new water supply regulation, or cessation of supply of water (or of electricity, for that matter) from a particular source. We have seen this with reactions to water stoppages throughout the country, and with the ways in which women in Limpopo Province turned government imposed water use restrictions – and failures in the functioning of water supply infrastructure – on their head (Loate et al., 2012).

Integrated water resource management is thus a creature with many heads; and the integration can be planned for, or can be an outcome; it can result from an initiative by the administration, or it can result from adaptive action by the recipients of water, such as the women of Limpopo, or the riparian communities of the Ganges River, whose "cultural flow requirements" match "very closely those required for the maintenance of the biota and natural processes" in the river (Lokgariwar et al., 2013: 15).

Such approaches as that utilized in the Ganges case emphasise the need for a holistic vision – where integration is achieved, not through adherence to some mechanical view

of a system, but by critical inclusiveness, by taking all relevant perspectives into account. As we shall see later, this provides a very compelling basis for an ethics of water resource management. A similar approach of inclusiveness was followed by the MACH project, which sought to revive the wetlands of Bangladesh, but by regarding the wetlands as an inclusive landscape, (rather like a social-ecological system) – which, if it was to be saved, had to be seen as shaped by and as characterized by various processes and their problems: biophysical, social, economic. This required an inclusive, multi-pronged, integrated approach (Renwick and Joshi, 2009: 56).

An integrational approach also needs to be process-based, in the sense that the lasting integration it achieves will be more adaptation-based (with the integration emerging from the ability to adapt, rather than the product of a careful and coherent initial design), responding to practical problems and real needs as they unfold – bearing in mind that in a complex system, feedback takes on a dynamic of its own. Integration is thus an ongoing orientation, in which the goal is obtained more at some times than at others, given the realities of the ongoing situation.

An example of how such an integrated approach emerges over time relates to the situation concerning Lake Biwa in Japan (Kamal, 2009), where since at least the 1950s, conflicts had been developing around the lake as a natural resource and the quality of the water that was emerging from it for human use, vs how the lake and its water were being polluted by increasing urbanisation and industrialisation in the area, and whether what this was doing to the water quality and environment was acceptable. Citizens' action and law suits had resulted, with a range of voluntary associations directed towards conservation coming into existence, which included private companies. These pressures – both legal and political – to "address water quality and environmental conservation required substantial organizational changes in the Shiga Prefecture to reflect the changing focus and priorities towards environmental conservation" (Kamal, 2009: 129). The outcome over time was a series of trendsetting procedural and legal changes which became environmental and water quality standards at the Japanese national level and even internationally. The integration which emerged as that between the interests of a range of different stakeholders, was based on the emerging understanding that such an important issue needed to be reconceptualised away from a single interest issue (such as meeting the interests of, e.g. industrial developers), to a "Multi-stakeholder approach" (Kamal, 2009: 132) geared to protect the biodiversity of the Lake Biwa and its catchment, as well as to enhance economic interests.

Effective water management therefore needs to be flexible, to be able to adapt to changing circumstances. In this regard Pollard et al., argue that "A key lesson is that management processes can be improved by making them more flexible and adaptive so

as to deal with uncertainty, thereby building capacity to adapt to change" (Pollard et al., 2011: 13). It is uncertainty that characterizes so many of the contexts in which we have to make decisions that affect the provisioning and processing of water. As this report is being written, (on a lap top plugged into the mains electricity supply system), it is not clear where there is going to be electricity supplied today, for how long, and at what level of the national grid, because of "load shedding" due to shortages of supply at ESKOM at national level. Such load shedding has serious implications for the supply, purification and distribution of water. A central uncertainty in this regard is that of water variability, which relates not so much to absolute amounts of water, but to the ability to manage water supply so that it is available throughout the year, regardless of rainfall season (Lenton and Muller, 2009:3). Water management systems need to develop practices for dealing with such uncertainties (Pollard et al., 2011: 34). Central to this would be the ability to overcome the same kinds of basic shortages that are always confronting resettlement officials when faced with the deadlines of having to move people: mutually reinforcing shortages of resources, staff, skills and time – and in the South African context, energy. All of these make for different – and interacting – kinds of uncertainties.

An inability to deal with any of these problems when they arise leads to a loss of flexibility, as everything that is connected to that particular problem has to be put on hold until that particular issue is resolved – with one certain kind of outcome: an interruption in the supply and/or quality of the water in the area. My argument about resettlement, as an intervention with the real danger of making for a loss of flexibility, needs to be taken on board as a real risk to be planned against in water management projects, i.e. that water projects need to be consciously managed in such a way that they do not make for a loss of flexibility in the lives and routines of the people the water is intended to reach.

There is a need to involve all stakeholders in a water management project.
Resettlement projects, while in many cases going through the motions of consultations, have not genuinely taken the interests of those who have to move into account, The case of Lake Biwa in Japan, shows the importance of taking the participation of all stakeholders seriously, by addressing the rights and entitlements of all groups depending on a water source with equal zeal and in the same terms (Kamal, 2009: 127; 133).

Related to the need to involve all stakeholders, is the need to take into account the fact that all stakeholders are not equally placed to participate, to make their voices heard, to exercise their rights. Zhibin warns us, in the context of voluntary resettlement projects in China, that: "The better off are better able to exercise agency, excluding the poor from involvement in projects" (Zhibin, 2003:176), thereby "benefiting from policy initiatives at the cost of the poor"(2003: 223). Those who are able to speak the language of the

project – literally (e.g. Mandarin or English) as well as the various kinds of 'project-speak' that are used, are clearly at an advantage to those who cannot. The World Bank, in reporting on an initiative to promote dialogue in meeting water and energy needs, warns us that a place at the negotiating table does not guarantee effective participation. There is a danger that " participatory approaches may mask different levels of power and influence, exaggerate the level of agreement reached, and expose disadvantaged groups to manipulation and control by more powerful stakeholders"(World Bank, 2003: 81). In that regard, we need to take disproportionate steps to train and empower the disadvantaged and the poor to enable them to participate in projects on as equal terms as possible (Renwick and Joshi, 2009: 57, in the context of a project in Bangladesh that was seeking to revitalize fishing in the floodplains of Bangladesh).

5.ETHICAL ISSUES IN WATER RESOURCES MANAGEMENT

It may be useful here to clear the ground and clarify what we will be talking about in this section, by making a preliminary distinction between morals and values, and ethics. *Morals and values,* we take to refer to *the specific ideas and values* that individuals or groups of people, mostly at an unreflective level, believe to be good or bad, such as monogamy, or democracy, or Islam, or whatever. We take *ethics* to refer to a systematic and reflective concern with the *principles* in terms of which we seek to distinguish between what is to count as right or wrong, good or bad, within ourselves, and in our behaviour towards other people and towards nature. And flowing from that, a concern with: what are the implications of putting a particular view of what is good into action? So, we will here be more concerned with issues of ethics as principles for the determination of good and bad, and with the taking of appropriate action in relation to water resource management.

How humans behave in relation to water is significantly informed by the value systems to which they subscribe, and the place of water in those value systems; How is water seen in relation to human society and welfare – as a means to serve human beings? As something of intrinsic value in its own right? As part of a complex socio-ecological system?

The document which contains the guiding principles for water resource management in South Africa, both in legal and in ethical terms, is the National Water Act (Act No 36 of 1998). The NWA is undergirded by the two foundational values of equity and of sustainability, in such a way that we can see these as guiding principles which would inform the way any water management situation would need to be organized in South Africa. They are therefore not situation-specific moral level prescriptions. It is in that sense that we call them ethical principles. In the same way that the principle that resettled people – because they have been left worse-off by the very experience of having been moved against their will – should be left better-off after removal than before, is an ethical principle, and not a situational moral option.

IWRM is therefore not value-neutral, as it embraces these two foundational values. However, in the same way that there are times when it is not possible to treat all stakeholders in a resettlement situation equitably – not least because of the reality of power differentials (de Wet, in press), so in the same way, it does not seem possible to treat all ‘stakeholders’ in water management situations equally – not least because humans have to argue on behalf of aquatic ecosystems – again, involving a power differential. In the face of limited resources (with humans defining what is to count as ‘limited’), it could be argued that there is a *de facto* agreement about respecting the right

of the aquatic ecosystems until this limits the realisability of other legitimate rights, such as socio-economic rights.

So, not only is water-management not value-neutral, but inequalities are seemingly inherent in water management as such. As we have seen in the section on Social and Gender Aspects of Changing Patterns of Water Access, water is unequally accessed and distributed, and this cuts right across a range of other socio-economic inequalities. So, socio-economic inequalities are at the heart of the issues with which water resources management has to deal – and this in turn results in the rights of aquatic systems being taken less seriously.

Positive water management can go a considerable way towards resolving the negative trade-offs caused by inequalities compounded by shortages. In Sukhomajri in India and in the floodplains of Bangladesh, better water management has increased household incomes (Lenton and Muller, 2009b: 206). However, efficient and even-handed administration is not always possible (not least because the commitment and political will may not always be there – whether at local or higher level). I wish to argue that issues of efficiency/capacity/wherewithal do seem to impinge directly upon our capacity to act ethically, and that such capacity should be seen as having an ethical dimension. Not having one's house in order so as to be able to deliver services one has undertaken to deliver, is to be in breach of commitment, to have failed ethically, in some way.

When 'things do not work' – or only work partially – (and Clifford-Holmes' (2015) PhD is a detailed study of the interrelated ways in which things do not work with regard to the ways in which water flows and does not flow in the Sundays River Valley) – water managers have had to be selective with the water they do have and what they do with it. One cannot treat all sectors equally. Who is to get water first/most of the time/treated/untreated water? Schools need potable water, while industrial users need reliable water, etc. (Lenton and Muller, 2009: 6). Various criteria come into play – as do power plays, to guide/influence water managers in the way they allocate water. Grahamstown is known for periodically suffering from water cuts – and it is known that these cuts do not hit the whole town in the same way or for the same length of time. Some people in the township have been without regular water for months. It is always the poor who are hit the hardest by variations in or disruptions to the water supply system. In such circumstances – and the great majority of municipalities in South Africa are not regarded as financially-administratively functional by the Auditor-General – it is not possible to uphold the two ethical principles of the National Water Act, i.e. equity and sustainability.

Such variation is exacerbated – and may even be caused – by poor water management. In the case of the Sundays River Valley, water supply has been problematic for the last few years, with the municipality being placed under administration, various government interventions taking place, the mayor going into hiding during protests and burnings in late 2014. There has been a cumulative history of water resource mismanagement, which in this case is at least partly responsible for the problematic water supply over the last few years (Clifford-Holmes, 2015).

Equity and sustainability are not by themselves sufficient ethical principles to make for effective water resources management. If they were, they could guarantee inclusiveness, of all the constituencies concerned. And such inclusiveness is clearly what they are trying to achieve and should be at the heart of any water management ethics system. *Being able and responsible* to manage water resources in an inclusive, equitable and sustainable manner therefore takes on the importance of a third and enabling, ethical principle – because without it, the other two have been shown to be ineffective. Capacity, as described here, brings other ethical principles to life and enables us to manage water ethically. It is therefore an ethical capacity, and resource – and effectively, a principle.

6.CONCLUSIONS AND SOME SUGGESTIONS FOR THE WAY FORWARD

We have argued in this project for the significant similarities between the ways in which place (in the sense of meaningful space) and water serve to undergird human settlement and society, and serve to 'emplace' human beings in social settings. We have drawn attention to the multiple and complexly inter-related ways in which place serves as a marker in society, and in which water flows through the various aspects of society. Both place and water have an undergirding, multi-purpose and integrative role in settlement and society, which occurs through complex institutional and social processes, in which people are exposed to significant risks and opportunities, many of which are not necessarily within the control – or even grasp – of the officials involved. We have also sought to show that the ways that place and water impact across society are interwoven, giving each other viability and meaning. And that this has political significance. It was not without reason that the first Ministry of Water Affairs in the democratic South Africa sought to separate rights to river water from land ownership, or that wells are so deeply politicized all over the world.

One of the key lessons emerging from this study relates to the fact that one cannot separate the various aspects of an attribute such as place or water from each other. The understanding we bring across to water management from the study of emplacement in the context of resettlement, is that place is not a neutral, automatically replaceable entity, either at a totally amoral characteristic-for characteristic (e.g. size, soil fertility) basis, or on a monetarily commensurate basis (so much money for so much land). A specific place means many things – many of which cannot be taken out of that specific locational context. One place is not simply replaceable by another as if something called history has never happened. In the same way, water cannot simply be reduced to a matter of availability, volume, pressure, water quality, potability level, budgetary implications, etc. One cannot totally separate the technical from the socio-economic and cultural and therefore from the political and even religious aspects of water – as anyone knows only too well who has ever been involved in sharing a canal system with others, or has had to decide whether to wash her/his hands in a not-too-clean bowl of water most others seem to be using, at a rural funeral, when her/his hands are not even dirty (but he/she has been in the presence of the dead).

What are the policy implications for water resource managers of the fact that one cannot in policy – because one cannot in reality – separate the various attributes of a phenomenon like place, or water from each other? If water flows 'all over the place', finding its own level, even sometimes flowing 'socially uphill',, making 'administrative mud' around the departmental doorways of those officials, who like to keep their

department's business separate – what is an ordinary water resource manager supposed to do?

What is being put forward here is a potentially fresh way of looking at the idea of 'integrated' in IWRM, in the same way that we have tried to adopt a fresh way of looking at in an integrated manner at what we are doing when we are observing people moving from one place to another with forced group resettlement. Integration did not emerge from looking at the phenomenon of resettlement from a range of different institutional perspectives (e.g. economic, psychological, spatial, social, administrative, housing, etc.) – and then trying to sew them all together. It rather emerged from looking in a more open-ended manner at the phenomenon of resettlement itself and watching the range of ways in which it 'behaved' and impacted the people involved, as well as these various institutional domains we had pre-ordained for our own purposes to make sense of place for our own purposes.

And it is the same when, by way of a water project, we intervene in the ways in which water flows in society, in terms of the official institutional channels that have been provided for it, as well as in terms of the economic, political and cultural realities which interact with, and modify, those official channels. We need to arrive at the integration that emerges from observing the dynamics of the medium we are working with (water) by ascribing it, as it were, a something of a life of its own (within the limits of the constraints and possibilities of the project at hand) and taking account of the ways in which it flows through society, and the linkages – hydrological, social, demographic, economic, political, health-wise, etc. – which that involves. It is that reality, or set of interrelated realities, that water policy, and water resource managers, need to take account of, on an ongoing basis. So, it would seem to be sound water management policy and practice to take the full range of water flows in the relevant situation into account.

In this context it would be wise to take into account the vulnerabilities and inequalities in relation to access to and distribution of water, to which a number of the cases studies have drawn attention. People are unequally placed in regard to water, and water does not find its hydrological and its political resting points at the same level. Issues around equity relate to tensions at the heart of the National Water Act, as these relate to tensions at the heart of society.

If water resource managers are to be able deal with water in such a way that they are going to try to provide it in an equitable and sustainable manner, then they are going to need the third ethical component, mentioned earlier, i.e. being capable and responsible to do so. This capability involves an understanding what makes a settlement vulnerable or resilient in relation to problems or changes arising with regard to water supply or

quality – and how to facilitate the necessary processes of re-adjustment. A sound knowledge and understanding of the real and multiple flows of water through a human settlement, and how these relate to the inputs of official water institutions and infrastructure, as well as to other factors and patterns of organization – and then developing a working relationship between the various groupings involved with water flow in its various forms – would be a significant starting point for developing a resilient water management system at local level.

The kind of approach argued for in this Report would seem to fit very well into one of the WRC Lighthouse ventures, i.e. Water Sensitive Design. The Lighthouse programmes "seek to generate knowledge which contributes positively to our communities, reducing inequality, and growing our economy, while safeguarding our natural resources" (WRC, 2013). While this is a tall order, it will not be possible without an understanding of the undergirding and emplacing role of both place and water – and of their interrelatedness in settlement and society. Lighthouses are "trans-disciplinary, multi-KSA and inter-institutional mega-projects that will examine priority water issues across the innovation value chain" (WRC, 2013). The kind of emplacement analysis put forward in this project, and its transposure into the field of water management, is eminently trans-disciplinary, and calls for co-operation between various government institutions – and indeed, between government and non-government institutions.

By drawing attention to the multiple ways in which water flows through society, the emplacement-water analysis actually challenges us to think again about what we might understand under priority water issues – which we might up to now have thought of in rather technical supply and demand ways. Water is also, and vitally, a social, economic, and political issue. If poverty and inequality are important to the nature of our society, they are central to the way water is accessed. Therefore the attempt to deal with poverty and inequity of access to water must become prioritized in water policy and its implementation. This has implications for the way water management decisions are to be made, as they now need to be made in an integrated manner, in the sense of bringing the socio-cultural, economic and political dimensions of water into alignment with the hydrological, financial and administrative aspects of water management.

The need for this kind of integration relates directly to the WRC Lighthouse venture of Water Sensitive Design. "The purpose of the Water-Sensitive Design Lighthouse is to develop a critical mass of knowledge around the integration of planning activities for the adoption of water-sensitive design"(WRC, 2013). The emplacement-water analysis put forward in this project has given a vision of what water-sensitive design could actually be, or at least incorporate , i.e. design in terms of the multi-faceted and complex roles that water plays in society, Emplacement-water analysis provides a vision of settlement that is

sensitive to both people and water, and the range of ways that they interact, as well as the wider environment in which that settlement is situated. This is an integrated water-and-people sensitive design, which flows logically from the vision of integration that the emplacement perspective supplies. This is not a simple, functionalist, kind of integration, where each component is integrated to the whole through the way it contributes to the maintenance of the whole. Rather, the integration is provided through a particular underlying foundational component in society or settlement (such as place or water) and the ways in which that component influences the various aspects of society/settlement (such as the household, agriculture, health, religion, etc.) – and the ways in which they relate to each other.

Emplacement analysis is not a specific theoretical framework, such as structuralism, or actor – analysis, or political economy, etc. It is rather to be seen as a perspective about the way in which foundational factors such as place and water underlie and cut across society. It can be used in conjunction with different 'macro level' theories about the nature of society or human behavior. It is thus more in the nature of a methodology, a way of looking systematically, from the perspective of place, at where and how water 'flows across society', at the role it plays in different aspects of society, at how it serves to play an integrating role as a link between these different aspects of society. If water researchers and managers look at water from this wider perspective, rather than from the point of view of isolated institutional perspectives – then one is likely to obtain the critical (and relevant) mass of knowledge for planning activities called for by the Lighthouse programme. This will also enable us to arrive at a more integrated and viable concept and way of implementing sustainability.

This vision "to transition South African cities, towns and villages closer towards water-sensitive environments which take into account their socio-political drivers and meet their service delivery responsibilities" (WRC, 2013) will however require a radical revision of municipal and local government. Not only because it will call for greater efficiency and responsibility (the third ethical pillar mentioned earlier). But also because it is going to require local level water officials taking on board a different and more intellectually and morally demanding vision of what managing water involves. We are asking water managers to move into a new and higher level of risk in their jobs, i.e. yet another kind of integration.

We suggest that the perspective of emplacement from the field of displacement and resettlement has great advantages to offer the field of water resources, and specifically Integrated Water Resources Management. We would like to end off with some specific research and policy related suggestions for the Water Research Commission, water managers and readers more generally to consider.

Research Related Suggestions

The suggestions below are in the form of research questions which come out of this Project. More detailed research projects can be developed from these over-arching questions. It is believed that the information emerging from such focused inquiries will contribute significantly towards the data basis necessary to generate policy that is able to build on the insights offered by emplacement analysis and its extension to the analysis of water related issues, as well as to Water-Sensitive Design.

1)What factors (e.g. legal, policy-wise, budgetary, administrative, socio-economic, geographic/locational, local cultural-political) influence the 'flow of water across society' (i.e. the supply, accessing and distribution, as well as the quality, of water) across and within different socio-economic groupings? Such research would need, not only to distinguish socio-economic groupings within a specific area of water management, but also within such groupings, to be sensitive to issues of inequality and poverty, gender and generation. Research would also need to look at how access to and distribution of water may serve to differentiate between, and/or to link, members of different socio-economic groupings. (We saw examples of such differentiation and linking in Loate et al.'s (2012) analysis of women's use of canal water in Limpopo Province, and in Crow and Sultana's (2002) analysis of the use of wells in Bangladesh).

2) How do the specifics of access to and distribution of water to particular 'water constituencies' – e.g. housing (and within housing, to various groupings, such as 'town' and 'township', 'formal' and 'informal), to commercial agriculture, to industry, services, etc. – influence the ways in which they operate, what they can and cannot do, how they do it? Do such 'water constituencies' (within a single water management area) co-operate, or do they find themselves in competition for water?). We saw an example of such competition and its negative consequences in the Sundays River Valley in the study by Clifford Holmes (2015). Such research would need to focus on a specific area of water management, and look to the nature of the linkages between different water constituencies.

3) In what ways do current water management structures, as well as levels of staff training, provision and commitment, serve to facilitate and/or to impede the management and distribution of water in ways that relate to the ability of water to perform its multi-sectoral and integrative role in society, as argued for in this Project? Such an approach would enable the twin goals of equity and sustainability, as espoused in the National Water Act (No 36 of 1998), to be progressively realised. Such a project would require interviews with a range of personnel in a representative sample of water management structures in order to generate the necessary data base.

Policy Related Suggestions

What follows, is not a suggestion concerning a specific new policy that should be introduced by the Department of Water and Sanitation – but rather a set of suggestions for a series of cumulative and inter-related procedures, ways of going about things, at the local water management level. It is suggested that this set of procedures will enable the perspective of water as performing an emplacing and thereby integrating role in settlements and society, to be applied in water management. So, at the level of specific water management areas, it is suggested that the following steps be introduced:

1)Identify and gain some basic socio-economic/institutional understanding of the various constituencies (socio-economic and institutional, formal and informal) to which water 'flows', whether officially or unofficially. It is important to state that this kind of information-gathering exercise (see (3) below) should be for bona-fide information-gathering purposes only, i.e. to give analysts, officials and planners an understanding of the real situation, the types of issues, on the ground. This information is to be regarded as confidential at the informant level, and may not at any future time be used to take action against people who, as a result of this investigation, have been found to be 'unofficially' or 'illegally' accessing water. Anybody participating in a research or administrative capacity in such a set of procedures would need to sign such an undertaking.

2) Establish communication, and regularised channels of communication, between local water management structures and all of these constituencies, possibly in the form of representative committees of some kind

3) Build up knowledge and a data base of how water flows to, through and between these constituencies, and of any problems in this regard. This can be done through working closely with members of the committees mentioned in (2) above.

4) Based on (1), (2) and (3), develop a model of how water 'flows' – both literally and socio-economically – within the water management area concerned. This would require the identification of

- Relevant constituencies
- Issues within those constituencies (e.g. poverty, inequality, deteriorating infrastructure) relating to how water is accessed and used
- Links around water between those constituencies
- The structure of water management, and its influence upon how water is distributed.
- Relations between water management and relevant constituencies, and issues in their interaction

It is important that this model be developed in a participatory manner, involving the input of all the constituencies concerned.

5) This model and data, as well as the active and ongoing participation of the various 'water constituencies', should feed into water planning and management at the level of the relevant water management structure.

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