



Liquid Dynamics: Accessing Water and Sanitation in an Uncertain Age Symposium Report

Synne Movik and Lyla Mehta

Liquid Dynamics

A large, abstract graphic consisting of several thick, overlapping curved lines in various shades of green and grey, set against a solid light green background.

Liquid Dynamics: Accessing Water and Sanitation in an Uncertain Age Symposium Report

This report summarises the proceedings of the two-day Liquid Dynamics symposium held at the STEPS Centre in Brighton in November 2009. The Water and Sanitation domain of the STEPS Centre uses the notion of Liquid Dynamics refers to capture the complex dynamics and interactions between the social, ecological and technological dimensions of water and sanitation. The intention is to advance interdisciplinary perspectives that can guide practical action to help address issues of sustainability and social justice in water and sanitation. In the global water talkshops, such as the World Water Forum, water issues often end up being cast in rather polarised terms, such as whether water should be a human right or an economic good, or whether supply should be privatised or be in the hands of the public sector. The symposium's aim was to break free of such sterile dichotomies, and to think more creatively about access to water and sanitation in an age of uncertainty, through bringing together a host of academics and practitioners in the water and sanitation domain

The symposium focussed on four broad themes: climate change and uncertainty; urban and peri-urban challenges; sanitation and disease ecologies and rights, technologies and access. A range of diverse perspectives were aired and shared, and exchanges and debates were characterised by energy and enthusiasm. It is our hope that this event can provide a useful starting point for continued conversations and collaborative efforts, through the sharing of resources, follow-up discussions, and future conferences and research initiatives.

About the Authors

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About the STEPS Centre

How do we deal with the spread of HIV/AIDS or avian 'flu? How can farmers in dryland Africa cope with the challenges of climate change? How do we address water and pollution problems in rapidly growing Asian cities? Who benefits from genetically-modified crops? Today's world is experiencing rapid social, technological and environmental change, yet poverty and inequality are growing. Linking environmental sustainability with poverty reduction and social justice, and making science and technology work for the poor, have become central challenges of our times.

The STEPS Centre (Social, Technological and Environmental Pathways to Sustainability) is a new interdisciplinary global research and policy engagement hub that unites development studies with science and technology studies. We aim to develop a new approach to understanding and action on sustainability and development in an era of unprecedented dynamic change. Our pathways approach aims to link new theory with practical solutions that create better livelihoods, health and social justice for poor and marginalised people.

The STEPS Centre is based at the Institute of Development Studies and SPRU Science and Technology Policy Research at the University of Sussex, with partners in Africa, Asia and Latin America. We are funded by the ESRC, the UK's largest funding agency for research and training relating to social and economic issues.

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Liquid Dynamics: Accessing Water and Sanitation in an Uncertain Age

Symposium Report

Synne Movik and Lyla Mehta

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INTRODUCTION

In an era of unprecedented social, environmental and technological change, the STEPS (Social, Technological and Environmental Pathways to Sustainability) Centre has been concerned with linking environmental sustainability and technology with poverty reduction and social justice. Since 2006, STEPS has been developing the 'pathways' approach that interweaves social, technological and environmental considerations with dynamic change across the domains of water and sanitation, agriculture and health and the themes of dynamics, governance and designs.

The water and sanitation domain in STEPS is developing the notion of 'liquid dynamics' in order to advance interdisciplinary perspectives with practical action that will help address issues of sustainability and social justice in water and sanitation. Liquid dynamics refers to the often neglected patterns of interaction between the social, technological and ecological dimensions of water and sanitation, raising questions about uncertainty, risk, politics and power. But such dynamics have often been ignored in conventional policy approaches.

As became evident during the 2009 World Water Forum in Istanbul, water and sanitation debates continue to be framed in rather technocratic terms, disconnected from the everyday needs of poor and marginalised women and men. Discussions often tend to be polarised and charged, for example revolving around whether water should be considered as an economic good or a human right, or whether to adopt private versus public service provision. The Symposium thus sought to break free of such conventional framings and polarisations, and start thinking more creatively around issues of access, complexity, uncertainty and governance in water and sanitation, bearing in mind health and agriculture linkages. The Symposium was therefore an opportunity to bring together people with different perspectives to bridge the divides evident in Istanbul and other global talks. It aimed at interdisciplinary engagement on current hot topics such as water/ sanitation and climate change and the water and sanitation 'crisis' in order to encourage 'blue sky' thinking in terms of research, analysis and action as well as to explore avenues for future research areas and collaborative efforts. By critically examining uncertain dynamics, governance and learning/ appraisal challenges in key policy areas such as climate change, urbanisation and water and sanitation governance, the organisers hoped to begin a process that would address how alternative pathways can be found that meet the needs of the marginalised in a sustainable and just way. Each session began with stimulating interventions from a few participants, followed by discussion, debate and exchange.

INTRODUCTORY SESSION

Lyla Mehta, Melissa Leach

The Symposium opened with introductory presentations of the STEPS Centre's pathways approach, and its application in water and sanitation. We live in an uncertain age, and we must negotiate the politics of sustainability while ensuring human well-being is not compromised. There is a general sense of frustration around water; ideas tend to be recycled, global debates are disconnected and polarised, and often ignore the embeddedness of water issues and the questions around climate change and availability. Water in this context refers to small and big

water, for life and for production, domestic and large scale, and also includes sanitation and all of its linkages to water. Can this symposium create space for creative, blue-sky thinking and explore linkages and collaborative potentials to ask: How do we move beyond the current disconnect? What are the pathways to addressing all of the variables of uncertainty, access and governance?

The idea of the 'pathways to sustainability' approach, central to this conference, was developed by the STEPS Centre, a group of researchers at IDS and SPRU, in collaboration with global partners. Water and sanitation is one of three STEPS Centre domains, and the cross-cutting themes are dynamics, governance, and designs. The pathways approach was developed in response to the growing recognition of complexity and dynamism of interlinked social, ecological and technological systems and the fact that the search for big, technical-managerial solutions that still dominates development approaches is premised on a more static, singular view of the world, a fundamental mismatch that leads to cycles of failure emerging as backlashes from nature, politics and mires of disagreement. We must move towards a normative, politicised perspective on sustainability that includes discrediting empty rhetoric and recapturing it as a discursive resource, and that moves beyond generalised, colloquial notions to address qualities of human well-being.

There is a need to recognise the dynamics and interconnectedness of social, ecological and technological systems, as systems and their dynamics are always open to multiple framings and narratives produced by people and institutions. Framing occurs in terms of scale, boundaries, key elements and relationships, dynamics at play, perspectives, interests and values. Some frames and narratives justify and become interlocked with powerful pathways; trajectories of intervention and change, but there are always alternative narratives and hidden narratives. Elements of sustainability: stability, resilience, robustness, and durability will be required in different ways at different times to solve different problems. Governance pressures tend to favour solutions that create stability, incumbent institutions tend to favour strategies which preserve the status quo and sometimes these are supported and perpetuated by the media. There is a need for an 'opening up' of discussion to recognise alternatives; to be explicit about conflicts and trade-offs, discovering roles for new tools and methods, being cognisant of the politics of sustainability, and taking part in progressive engagement. Building on STEPS ideas, we must be explicitly normative and reflexive; examine framings, accept incomplete knowledge, and be aware of own positionality

There are many current fault lines, dominant assessments and dominant perspectives in water and sanitation; there is a focus on techno-centrism that does not acknowledge interlocking social, technological and environmental elements, in other words, 'liquid dynamics.' These debates are framed by largely Northern players, promoting universalised positions and standardised definitions. There will be struggles over not just the access to water, but its meanings to different populations. We must acknowledge the multiple and varied framings – economic, volumetric etc. – of scarcity as well as the varied values and meanings that people attach to water issues. Water and sanitation are multi-faceted, encompassing social technological and environmental dimensions. Governance and designs are key. In water and sanitation; there has been a shift from centralised to decentralised solutions, but problems arise when we start to explore how these decisions are made and who they involve. Water systems are vulnerable to climate change and disasters, and we must look at sustainability from the position of social justice and ask questions of scale, while acknowledging politics and varying knowledges.

Discussion

After this initial introductory session, the floor was open for comments. Some of the issues that were highlighted included: the importance of addressing the divisions between contextualised and universalist perspectives when discussing the solutions to water and sanitation issues, as pointed out by Kirsten Hastrup. How can we make these ideas relevant and useful for an engineer in the field, and make them work in different contexts and different countries? How do we make solutions better, and what is to be understood by 'better'? asked Mansoor Ali, who cautioned that we need to be aware of the historical context of particular alternatives. Melissa Leach observed that what matters is to make the politics of alternatives explicit. These discussions and alternatives are often uncomfortable, but they need to be confronted. Jan Selby, drawing on his experience with the Israeli/Palestinian conflict and the water inequalities there, commented that while there are water disparities between Israelis and Palestinians, there are likewise internal disparities between water access and distribution. He found that many colleagues were not prepared to take a socio-political approach to water issues – so how do we encourage the inclusion of these elements in the debates?

CLIMATE CHANGE AND UNCERTAINTY: EMERGING ISSUES FOR WATER AND SANITATION

Roger Calow, Declan Conway, Kirsten Hastrup, Laurence Smith, Merylyn Hedger

Chair and discussant Roger Calow started by saying that it was important to have a space to do things differently and question the dominant framings of things such as scarcity, security, and climate change. Too often, adaptation becomes its own field, with its own discourse. The lack of communication between different areas speaks to the need to mainstream the discourse, and get out of the current 'straitjacket'.

Declan Conway said that he was approaching the panel issue partly as a climate change person and partly as a water resources person. He pointed out that in the massive international agenda, getting messages from water to climate is both critical and challenging. The water sector is more equipped to deal with climate change compared with other sectors, precisely because of water's inherent uncertainty and variability and the need to understand and develop tools to cope with such uncertainties. The scientific understanding of the impact of climate change on water – such as long term changes in precipitation patterns - is still evolving. In Africa it is not possible to say with any confidence if it is going to get wetter or drier, and the climate change community has under-weighted the significance of water for agriculture and other systems. It is likely that there will be an increase of risks, intensity of variability and more extreme events. But beyond that we have very little detail. It is absolutely critical that we look at the capacity of institutions and individuals to respond to unexpected events. What are the management and policy implications? How do we communicate the nature of the changes? What is the practicality of a non-stationary paradigm, where uncertainty becomes a central issue? And what are the possible responses? One can of course wait and see, but one can also look at our existing systems for contingency and planning; resilience, robustness, adaptive management – but what does that mean at a practical level?

Kirsten Hastrup introduced herself as an anthropologist, who was now looking at global water challenges. In anthropology, one talks about 'elemental forms' and water is both elemental to people's lives and a pervasive element in the world. Her current project examines how the most impoverished and vulnerable people deal with the full force of climate change. Some of these people are in a sense 'guinea pigs' for what is in store for humanity at large. The project defines areas according to types of disasters rather than geography. Such disasters include melting ice (too much water), leading to epidemics and the need to invent sanitation from scratch. Or areas hit by desertification (too little water) and the related issues of migration. What is at stake in these regions of disaster? How are perceptions of risk transformed as people are facing bigger risks and bigger fears? Such transformations challenge human agency, which depends on some degree of certainty. Without some kind of anticipation it is difficult to act in a responsible way. The universal/ contextual debate is an unproductive division; we all know some aspects of the universal, and we all know some aspects of the local. Hunters in the high arctic are following the changing science on the internet. They have access to universal scenarios and are linking it to their local situation. The challenge now is to work together and let them exist in the same frame.

Laurence Smith drew on his water management work in the UK, which focuses on the quantity and quality of catchment management for water resources. He shared his experiences from a meeting in London last year on the implementation of the EU Water Framework Directive, particularly regarding river basin management plans. The overarching goal was to have good ecological status in all water bodies by 2015, which has been accepted by national governments. However, there are many different actors with different concerns, and many say 'yes, but...' The position of representatives of environmental charities, such as for example Natural England, is to hold the government to account. Consumer councils are worried about water companies and affordability. National Farmers' union says yes, but farmers can't afford or pass costs. Academia says yes, but your scientific basis isn't good enough yet. These are complex or 'wicked' problems, where there are equally legitimate sets of values and framings for a problem. Climate change further compounds it because of long term problems and solutions and the extra layer of uncertain dynamics that it evokes. Thus, based on values, constructed, reality of politics and shifting policies, the response must accommodate a combination of scientific uncertainty and societal uncertainty. We need to emphasise both the lay stakeholder and expert deliberation, bringing together the combination of iterative scientific assessment and on-the-ground evaluations and perceptions. We need reflexivity and adaptive management that gives a sense of progress through time. But we must not be naive about the challenges of participatory engagement; the questions of scale and authority are familiar to all of us. But we do need to go down to a local level. In the context of developing countries, that raises the question of capacity and accountability. Wicked water problems need a broad societal response.

Merylyn Hedger stated that she was more interested in the policy world, rather than the academic, and noted that we are at critical point, with the window of opportunity to change things freezing over quite soon. Integrating climate change and water resource management is a necessary step towards instigating change. Questions need to be resolved, such as how much money is going to be given and who does what on mitigation? With respect to adaptation, it is accepted that we will get somewhere in the range of 100 billion pounds a year; a COP deal is impossible without money. New resources need to be targeted effectively and to avoid recreating problems that have been around for decades. But who captures and gets control of these new resources? A lot is being fought over - while there are signs that various communities are waking up, it will be the same old elites moving over. Moreover, most work is not currently focused on the poor and vulnerable groups. All actions have got to have measurable, verifiable results, and these could include new forms of conditionality that are very contested. The

challenge is to work out good practices on how to deal with climate variability for vulnerable groups, and to get it into the right fora. Timing is essential, and even if we want to challenge some orthodoxies we should just not bang the word 'uncertainties' about. Yes, there are liquid dynamics and uncertainties, but there is also some clarity, and we should focus on what we *do* know. We know it will get warmer and drier, and that this will have huge implications. There is an adaptation deficit, one million people already have no access to water, and it makes no sense to isolate climate change risk from climate variability. We thus need to develop an integrated climate risk approach.

Discussion

The issues emerging from this session centred on the notions of change, uncertainty and the knowledges and capacity to contend with these. Peter Newborne observed that we base our judgements on the recent past, on long-term, average situations that give an impression of stationary systems where the hydrological system is not changing. But climate change undermines those assumptions; temperatures will fluctuate. So how can we build that fundamental change into management systems? Bruce Lankford argued that we must remember that there is a lot of knowledge held at the local level; the problem is how to express that while recognising the issue of scale - how do we get communities to reflect critically on these scale issues? Laurence Smith reminded us that we have to take on the goals of the people who live in the water catchments area. They will share values about ecology, but it will always have to do with local jobs, livelihoods and their stake in the system. It is about starting a process and engaging with it. Kirsten Hastrup highlighted the importance of studying people with different levels of coping capacity, to better understand the amplification of what is happening. The vulnerable groups are trying to create their own futures; there is a will to make the future happen for their children. That is a tremendous resource. But how far may we generalise? She observed that there are many useless concepts floating around, but we should not let these concepts disappear, for we do not know whether a concept is useless or not. We must test a wide spectrum of ideas. They may inadvertently become tipping points for consciousness.

The importance of decision-making power being in the hands of affected stakeholders was highlighted by Edmilson Teixeira, who observed that participatory processes in Europe were more consultative than deliberative. Management is based on scientific knowledge and not enough time is spent finding out what the community wants, or to learn from them and their values. Someone in the audience remarked that too often, public participation has no public in it. We need communication between different groups about how they are using the technology to suit local needs. Laurence Smith observed that in the UK, the environmental agency has moved a long way; there has been significant change in that agency's culture. The first round of planning was not that great in terms of participation; during consultations, they said 'these are the measures, can you pay for them'. In the UK, we are behind what is happening in Brazil. The role of the public includes representation in a number of forms, and that opens up the debate about participatory processes. Joe Public will not always participate in all aspects of everything. It is about who can represent the public interest, who has that mandate or that legitimacy, and how appropriate representation is built. We need to be explicit about what is needed.

Knowledge is intimately tied up with power, and there are powerful narratives in climate change. Several comments from the floor picked up on the creation of such narratives; that we are involved in constructing enormous narratives that are moving very fast, and we can only understand these processes in hindsight. It is difficult to deliver nuanced, location-specific

context in place of the juggernaut that is currently rolling out the agenda. Climate change is becoming an excuse and a master narrative for a type of framing of particular problems in local development. For example, the long history of not giving water to Palestine is now being attributed to climate change. According to Declan Conway, we deconstructed a determinist understanding of the environment and now we seem to be moving to an over- deterministic understanding of climate.

Other points related more directly to policy responses. Gordon McGranahan asked whether anyone would want to take on the issue of legitimisation of certain climate change policies? In urban settings, people are evicted from floodplains because of policies that are being legitimised, correctly or incorrectly. It is interesting to try to tackle the big issues of the water agenda and access. Does the risk of climate change mean that that agenda needs to be pushed more heavily, or is the greater risk producing more decentralised systems? Which way should water policy go? Merylyn Hedger commented that the idea of adaptation is presented as apolitical, but that is of course not true; there is corruption and practical problems, which haven't been explicitly dealt with in climate change adaptation programmes. Climate change is a source of great energy and money, and is used as a big stick. Declan Conway commented that climate change is highly demanding for physical and social systems around water, we don't know what this means on the ground in terms of practical implications of models. And how do we get our messages across to the global level?

MEETING THE CHALLENGE OF URBANISATION AND ITS PERI-URBAN FRINGE

Tom Slaymaker, Bronwen Morgan, Jeremy Allouche, Gordon McGranahan and Lyla Mehta

The chair and discussant Tom Slaymaker introduced himself, and offered a few facts about urbanisation and sanitation; stating that even though the rate of urbanisation is rising and a third of people living in urban areas live in slums, just 1 per cent of aid is entering urban slum areas, and there is a continued neglect of sanitation in these areas. Is urbanisation a greater challenge than climate change?

Bronwen Morgan's research is focused on water and social protest, and their interactions with the legal system and governments, and she is currently examining the role of the law in the broader governance picture of water. Law is usually seen as invisible, or is bundled as a technology, a static framework in which water issues play out, a view Bronwen would like to challenge. Law serves as a baseline certainty against which we devise our actions and strategies and this is obviously linked to how the law is framed by the powerful stakeholders. There is likewise a discourse within the legal system that the language of certainty within the international law community has been constructed to suit commercial interests. Aspects of law in terms of water governance include: 1) the law as a place where people can make their own futures. Many believe it is entrenched in private sector interests BUT the law can also operate as a space for different kind of politics, including constitutional reform. An example is Cochabamba, where indigenous people sought to articulate a way of making law work for themselves. 2) A systems emphasis on law that includes reflexive governance; law is the ultimate meta-system for bringing different systems together. This is essential in the urban settings, because systems overlap so much (land rights, water rights, land tenure). There are also linkages between water

and finance, the lending from International Financial Institutions that supports investment in water services needs a legal framework in which to operate. However this leads to many issues and questions, such as what the regulatory details of executing rights on the ground are? 3) Lastly, law is a place where the politics of these varied visions is exposed. Disputes that arise within the law highlight the way that varying politics clash. Is it possible to think of new institutions that could address these issues?

Jeremy Allouche, IDS Fellow, has a background in International Relations and Political Science, and is currently focusing on water and security. Jeremy argued that when we think about water security, we tend to think about transboundary and domestic water conflicts, but should also include urban water security in the mix, as it is an understudied topic. This is not an entirely new subject - the US Homeland Security Act, 2002 looks at water infrastructure as a security issue, and this idea is spreading in UK and EU as well. The UN recently held a high-level symposium on water security, emergency planning and crisis planning, and there is also a discourse around water as a target for terrorism. Within academia, there is increasing discussion of water and risk - in the case of water, this can mean seasonality and access, and water resource management. This is challenging, as we are increasingly trying to manage amorphous security risks, and there seems to be a trend towards the securitisation of water. There are three ways that security is conceptualised; i) as water infrastructure, ii) as water contamination, and iii) as terrorist attacks on water systems. How can we understand this new water security paradigm? Is society more focused on risk and prevention, placing human security at the centre? Or is it linked to climate change and terrorism? Or is it related to a risk industry? How does this relate to the urban dynamic? Does this paradigm make us lose sight of some of the most important water issues, such as access?

Gordon McGranahan currently works with IIED, which is relatively well known for its focus on urban issues. He made the point that densities are declining in urban areas, and populations are moving to the periphery - still, the growth of African cities is related to population growth, not to rural-urban migration. There is a crisis 'feel' to the situation, and hence the reactions aren't to put in the infrastructure to serve new urban populations, but prevent the influx. Governments are developing policies to try to stop urbanisation rather than deal with it, because if you offer the services, you incentivise the migrations. For example, in China, the government is pro-urbanisation, and sees it as a way to deal with environmental and poverty problems. Converting land from rural to urban purposes provides income for the government and private sectors through land transfers – however, they do put in infrastructure. There are also crucial linkages to climate change, as most of this development is happening on the coast. Additionally in China, they are using urbanisation to move people off of the dry-lands in to the cities – another linkage between urbanisation, rural areas and water. The China model is different than many places in the world. In Ghana, peri-urban areas outside the capital Accra were not administered by the government, raising issues about land governance. In Buenos Aires there are poor municipalities outside the city where citizens are not squatters, but still services and governance responsibility for these areas are disputed. Urban and peri-urban water and sanitation issues are related to the informal sector and the government – where governments can't or don't want to accept the standards to increase water and sanitation. This is obviously related to legal issues brought up by Bronwen.

Lyla Mehta discussed the STEPS empirical case study on peri-urban issues and sustainability in Delhi, which focused on the ambiguity and challenges posed by peri-urban spaces and the organised irresponsibility of service delivery to the populations in these areas. She challenged the postulation that the law is always a means and a way of hope. In Delhi, the law has justified

and promoted the moving of people, which proves that in some cases, the law can be arbitrary when it is captured by elite biases. In Delhi, urban issues are couched in city beautification issues, and preparations for Commonwealth games. Dominant narratives and universalisms shape water management outcomes. These include belief in universal access to potable water (which is largely unrealised for most of the poor), cost efficiency, cost recovery and so on. Another discourse is water safety, but what does it really mean to deliver safe water? India has many local entrepreneurs capitalising on risk and safety insecurities, selling 'safe water'. We need to rethink waste water, and look at how it can be used. When thinking of a water system, is it perceived as linear or cyclical? Water may also have associated meanings of community and culture. Where land and land tenure is insecure, there are ways to get to water – these are sometimes illegal – but there are blurry lines between legality and illegality, where some participants consciously opt out of the formal system. These diverse framings of water raise questions about alternative pathways and methods of coping. How do we achieve sustainability in a transient zone? We have to accept different configurations and spaces while questioning ways of achieving justice, acknowledging that often justice can only be achieved through illegal means.

Discussion

Does law have the potential to provide greater certainty? Lyla Mehta observed that dominant narratives often jar with reality; the dream of universal access to water runs up against the unrealistic, unaffordable and in some ways inappropriate realities on the ground. Whether different forms of access to water are legal or illegal and the visibility that gives to groups, present unique challenges. What is the potential of the space of the law, is it progressive, or is it limiting access and improved governance? Bronwen Morgan pointed out that law provides the ability to link multiple issues and systems, from land to water to finance and the potential security of investments. Melissa Leach argued that law does have a role to play but law creates its own uncertainties. The security paradigm is moving us further away from the reflexive institutions that are needed to deal with these challenges.

Brian Reed also cautioned against the 'security' framing, as it makes people invisible, whereas 'conflict' is an active word; it is people fighting. Water wars have been going on for many years and we don't acknowledge that they exist. In his opinion, law cannot provide certainty. It is the investors and the policy-makers who seem to project hopes for certainties onto the law, not the lawyers. If you want to know what will happen in a dispute, you have to go to the dispute, it is open ended. Lawyers know that. The social relations and political economy of who decides is actually crucial. One acute example is the arbitrary notion of panels and local courts. The question there becomes, not to make law more certain but how to make a certain kind of lawyer so investments can become more comfortable.

Picking up on the notion of security and risk, Jeremy Allouche pointed out that risk is a non-stationary concept in relation to climate change, which presents an increasingly complex picture and 'moving target', and went on to ask what the emerging security discourses around water are, and to what extent there is a Northern bias in these discourses? A member of the audience commented that the distinction between threat and risk is not so apparent in the term 'water security', and that the idea of water security is a western-based approach that is expanding into a global agenda. Too much emphasis on 'security' will have an impact on other issues, such as access, that are much more important to the people on the ground living in poverty. A central point of the risk discourses or narratives, as Gordon McGranahan pointed out, is how they can be translated into context. Water issues themselves are mediated by wider processes, including

land and land transfers, how markets work, and the broader problem of city bureaucracies. This challenges our assumptions about what can actually be accomplished via legal frameworks. Melissa Leach responded that there is a need to connect risk and security, maybe the emerging water security paradigm reflects a move towards Beck's notion of a 'risk society', and this perspective also captures the incapacity of institutions to control and manage risks. Society then becomes reflexive, and disquieted, and how we deal with uncertainties comes to the fore. Lyla Mehta pursued the theme by asking who is defining risk, and to what extent is it based on evidence? In the case of the STEPS case study, there were global standards and national standards and local pollution boards and entrepreneurs, all of whom defined risk differently.

How do we finance diverse pathways to sustainability? Financing and investment in urban areas is what pushes policy solutions, argued Mansoor Ali, who pointed out that there hadn't been much attention paid to these issues. International financing is hugely important, and there is the question of financing by the informal sector. A member of the audience commented that, for large scale private infrastructure investments, there should be a global commission that would be more like the World Commission on Dams. Maybe the river basins in Brazil are good examples of more open systems. Gordon McGranahan acknowledged that financing issues had received little attention, pointing out that 'if we push for peri-urban financing, it is to get loans', and that this had its own problems. Most funding doesn't go to sanitation, leading to the problem, how are households going to cover costs for sanitation? What savings are going to be used to pay for services? Where there is progress being made it is in developing things like saving institutions, but attention to international finance doesn't fit at that level. There are similar issues in housing. The government cannot accept the standards the people are willing to live in - we need alternative pathways to get out of that situation.

Another issue that had received little attention was global health. Who defines what global health is, asked Cassandra Bergström. If it is the US, then the discussion revolves around contagious diseases such as malaria and AIDS. But if you look at who is dying, then the major culprit is diarrhoea. That is what the developing countries are more concerned about. Different actors choose different forums, which leads to multiple regimes and different sets of laws and rules. Melissa Leach responded that emerging water security, which is similar to global health, is about shoring up critical infrastructures in the interest of protecting elite populations, which is a very narrow notion of risk, one that focuses on health and personal security in the North and risks of terrorists in the North. It is not about confronting uncontrollable and unknowable uncertainties.

Pausing to sum up some of the issues coming out of the panel presentations and ensuing discussions, the following key questions emerged: How do we create institutions to promote justice in an area where there is so much ambiguity? Practically, how do we overcome the challenges? Are there places where there is a movement for sanitation reform? What is preventing that? Is it a tyranny of high standards? Is the movement towards that getting lost? To what extent is the vulnerability of water infrastructure systems changing? Has much changed in the past 15 years? Have you come across reforms in different countries pushing for different securitisation?

Brian Reed argued that the issue of rights and justice was not that helpful; but that one needs to look at the economy and the 'hard' impacts, such as cholera, which costs more than 10 years of investment in water and sanitation. Politicians can't run away from such numbers. Kate Bayliss asked whether it's really economics that changes things. Do we not need to have social justice higher on the agenda, rather than having to wait for an outbreak? Do we need an outbreak? The law seems a weak tool in some ways but it might be used as a stronger tool for social justice.

Lyla Mehta stated that people now feel they are immune to risks, but historically, such as during the Big Stink, everyone was affected. Melissa Leach picked up on this issue, observing that the problems of toxicity are affecting everyone now. Elites are also suffering from pollution, and that might trigger solutions for change. Are the disenfranchised invisible because cities have become mapped and zoned, in short, the mapping makes them invisible? A powerful argument is that security is not governed by 'military industry' but by a 'security entertainment' paradigm. Spatial images, the media, the internet all reflect trends towards beautification; e.g. the world cup in South Africa. New urban maps are being drawn around entertainment. Is there a role for drawing new kinds of maps including reclaiming the streets, citizen mapping, and GIS and other ways to remap environment? This can become a complementary route alongside the political economy. John Thompson mentioned that there is a big movement over participatory mapping, especially around GIS, and the urban spaces and competing claims over rights. According to Tom Slaymaker, participatory mapping has worked well in access to sanitation services. Looking at pictures of Dar es Salaam, it is near impossible to tell which areas are poorer and which are richer. However, if you map outbreaks of public health areas, you can see the hotspots of poverty.

SANITATION AND DISEASE ECOLOGIES

Brian Reed, Ingrid Nyborg and Shai Divon, Synne Movik, Mansoor Ali, Peter Newborne

Brian Reed works for the Water, Engineering and Development Centre (WEDC), a group of practitioners in water and sanitation solutions that take a view from the field, focusing on 'what works'. He introduced the session by saying that it would be taking a systems approach to sanitation, exploring sanitation in all its facets.

Peter Newborne from ODI presented a project (with Tearfund) which focuses on how specialists are going about advocating sanitation and hygiene. Advocacy is the art of convincing others; so which arguments for sanitation and hygiene are successful? Water and sanitation debates tend to be framed in technocratic terms that are separated from on the ground realities; so how do the advocates for water and sanitation issues work? If policy is the interplay between institutions and ideas, how do we go about shaping policies? Many view a health system as a formalised effort to influence the determinants of health. Yet in many countries, health systems are slow to pick up sanitation priorities. Simplicity and clarity are important. Community Led Total Sanitation is an example. A solid message is delivered, which generates disgust, thereby discouraging certain behaviours. Are sanitation advocates making a convincing case? Are advocates revealing that intestinal worms are an impediment to cognitive development? That lack of sanitation kills? Preliminary results show that apart from some islands of success, generally advocates are met with a health sector that is wary of sanitation and hygiene. Health sector specialists are focused on technical aspects and have an interest in promoting their highly technical skills, as opposed to simplified sanitation solutions. Generally, findings indicate that it is better to advocate at the community health worker level and with international donors than to lobby with the government.

Synne Movik, who has been involved in the STEPS Centre water domain work went on to talk in more detail about CLTS and the associated dynamics and uncertainties. CLTS was pioneered by Kamal Kar in 1999, and is now being implemented in more than 40 countries across the globe.

CLTS is about facilitating self-analysis of the consequences of defecation practices, and triggering a desire to change and unite in collective action, which hopefully leads to utilisation of local resources to construct toilets and change sanitation behaviour. Sanitation is a dynamic system, that is an intersection of social (power relations, perceptions of shit), technological (mindset, cost) and ecological (soils, water availability). Big ideas bring about big impacts, and CLTS is one example of this. How can long-term behaviour change be sustained? How resilient are the technological developments/homemade toilets? Does CLTS create other environmental hazards, such as for example groundwater contamination? How do we deal with uncertainties and risk? Also, how does CLTS interact with ecological sanitation, and ideas of recycling waste? This view sees human excrement not as a waste, but as a resource and a tool – therefore, is the framing of human waste in terms of disgust constructing hindrances to the success of ecological sanitation?

Ingrid Nyborg and Shai Divon discussed the ‘unintended consequences’ of approaches to development. Development interventions, such as CLTS and the Millennium Villages project, are designed in static ways. Shai is examining a Millennium Development Village project in Uganda that is bursting with expertise and Jeffrey Sachs’ style solutions. But what are the unintended consequences? For example, the primary goal of the school feeding programme is to reach education goals and keep kids in school by offering food. The numbers show it is working, attendance is increasing – it is also combating malnutrition, and children are more functional in the classroom. But the latrines are in a horrible condition with no hand-washing facilities. The water sources are nearby and contaminated with faeces, and these same water sources are used for the cooking and cleaning of the school meals. The unintended consequence is that the school feeding program has created a new route for disease spread.

Ingrid Nyborg asked how do we integrate goals, who should do it, and how? And what is the role of researchers in this process? The Norwegian University of Life Sciences is pioneering a unique MA in Pakistan, focused on Sustainable Sanitation. The hope is that these MA students can make a case for research and education, and capacity building activities. But the broader question is: how can we address this in an academic way that is relevant for people that are travelling to the field? We must conceive of sustainable technologies in a non-technocratic way that takes these solutions out of the sectoral or disciplinary approach. Academics should be assessing the procedures and methodologies for measuring results in the field. How can we do practical assessments to capture the dynamic nature of these circumstances, and achieve a process-oriented approach? What kind of capacity do we need to build and who should build it?

Mansoor Ali works for Practical Action, and grew up in a Karachi slum, which forms his view. He said that there are several important things to remember when we are discussing these issues: i) there are existing systems of people. Wherever you go, there are already mature systems that are embedded and working; they are already operational and sustainable, so we must pay attention to them and learn from them. ii) You need to build on what people are already trying to do. iii) How can waste be recycled in different contexts? When thinking about pathways, how often do we look back and into the details?

Discussion

Sometimes the problem is presented in terms of health, sometimes in terms of human rights, observed Tom Slaymaker. There are different ways to present these issues, and we are reaching to different actors that speak to their own material interests, cultures, values and interests. There

is a strong argument for sanitation, there's more than enough evidence, but if you want to present that evidence in the health sector, then you need to present it in a different way. Policy is one thing, but in the field, we usually work with health sector professionals and some knowledgeable engineers to deliver sanitation. Sanitation is always the last to be funded. Should there be a separate budget or funding layer, to prevent sanitation being hidden in layers of health?

Another point is the actual people in the field, especially women and mothers. If they don't have a good knowledge base, then the infrastructure is of less importance. Frances Cleaver observed that there is an authoritative nature to sanitation discourse. Local women she has worked with know about hand washing but sometimes choose not to wash their hands. Any authoritative narrative like CLTS is actually diverse and some people are worse affected by shame and disgust than others. We need to recognise that models and facts are tools, and that these are not neutral and do not necessarily produce equity. What are your arguments as a researcher; what are you trying to do? A related question was, who is doing the framing, and how do we solve problems? Cassandra Bergström, drawing on case studies from Nepal, said that their findings indicated that toilets were mostly about status. There were no NGOs in the area and the government couldn't care less. But still some people were building toilets and some were not. It was not about outside influence, but about people emulating their neighbours, about trends and status.

Synne Movik said that what happens in CLTS depends in part on the facilitator; disgust won't emerge in all settings. There is a difference between triggering collective analyses and facilitating analyses. There are also interesting cases of marginalisation in CLTS. Someone in the audience commented that what is vital is the power of the local knowledge to negotiate for their own interests and communicate that to influence policy and drive collective action. For researchers and agents of social change, we need to look closer at this. Gordon McGranahan picked up on this and said that CLTS is about bringing new knowledges together. It is often hard to tell the difference between processes that bring authority to bear, and those that do not. If you are two steps removed, say as a funder, it is really hard to do this well. How to distinguish between processes that are helpful and those that are not?

Melissa Leach commented that there is a gap: indigenous disease ecologies don't really exist. Even in this discussion, CLTS is about triggering collective action as a result of external motivation and emotion, as if CLTS is somehow working on a blank slate. But of course, you already have existing discourses, which are connecting ecology and health issues, which are framing different issues differently. It is only by understanding local framings of such dynamics that one can appreciate how CLTS is going to unfold. There will be clashes of discourses, and we need research that looks at local framings and resources. Tom Slaymaker argued that project mentality is a huge problem, and we need to get away from sectoral framework projects. But it is a question of capacity: we train students to be engineers and social scientists at the same time, but run the risk of them not becoming either. What do you train people on the ground to do? Is it about influencing a way of doing things or do you do research for the sake of doing research? Who is responsible? Ingrid Nyborg followed up on the issue, remarking that it was more about being in a learning mode than a convincing mode. It is hard to differentiate between practice, research and reflexivity – and that leads to and is reflected in good quality leadership. Gordon McGranahan pointed out that CLTS has traction because it is represented as a silver bullet. When you promote ecological sanitation, you undermine disgust. Clearly health doesn't drive these things. Cigarette smoke didn't use to smell so bad. It's a combination of bringing health and disgust together to create change.

TECHNOLOGIES, ACCESS RIGHTS AND UNCERTAINTY

Phil Woodhouse, Esteban Castro, Rob Hope, Bruce Lankford

Phil Woodhouse's work focuses on how water changes land use. Water becomes the medium through which change is transmitted, a mechanism for alteration in land use - the trigger could be policy, new markets, social shifts, etc. This session explored processes of change and uncertainty with perspectives from a sociologist, economist and water engineer. It asked: How are decisions in water and sanitation made?

Esteban Castro argued that we need to be more critical of the concepts we are using. We use concepts such as *sustainability* as common currency here. But if we don't discuss these concepts, we hide behind them and don't highlight the dangers. An FAO report said we need to extract 25 per cent more water to feed the world, however, the environmentalists say we need to extract 25 per cent less to keep the ecosystem on which we depend going. These are contradictory statements. Also we need to interrogate the notion of risk - whose risk, what kind of risk, who are the actors? And 'government', what is that? We too often avoid or forget about power. What kinds of values are defining the policies that we want to be amending? What kind of society are we trying to build with these water policies? On the issues of water rights and citizenship, Esteban offered an example from Finland, where the question of water and sanitation was a fight for rights that people did not really think about as 'rights' before starting to mobilise and make demands. Rights are not static. Regarding participation, sometimes participation means expected obedience. Sometimes it means passing to the people responsibilities that the state should have. One needs to clarify in each context what the duties of the State and the individual respectively should be. With regard to uncertainty, structural inequalities are the fundamental ones - how do structural inequalities affect access to water and sanitation? Esteban argued that the main challenges are how to achieve substantive democratisation of governance and management.

Rob Hope went on to link the discussion with behaviour and choice, charting how public policies match users' needs and preferences, where a major challenge is to link and aggregate multiple perspectives. For example, the World Bank takes an aggregate view of water services. But you can break water services into a format that you can test on user groups, using methods that capture preferences concerning reliability, cost levels, quantity, and quality in a pictorial way. Before even starting to develop policy, it is possible to get a feel for people's preferences, especially those of marginalised groups. Rob said that though it's not a perfect methodology, he had used it in South Africa and Mozambique, where it produced a sense of how policy related to local level needs. What do we think are reasonable entry points? Can we test out provisions before putting them into place? Can you predict who the winners and losers will be? This is not a silver bullet approach, but part of wider thinking of policy design.

Bruce Lankford started off by asking a question: Which one is better for the Nile delta, treadle pumps or large-scale canal systems? He introduced the concept of 'hydromentality' to capture how we meet complex needs and demands over complex space. There are plenty of choices, ranging from traditional technology to structured coherent technology. The hydromentality concept involves moving from physical and unitary origins into architecture and then into institutions, humans and water and control objectives. He developed a role-playing game using marbles to map competition and co-operation among farmers, and to create social space to

reflect critically on issues of sharing and technological designs. How do farmers, not experts, think about this?

The patterns of water distribution within and between systems and sectors represent a real challenge, it is very difficult to do uniformly. How should we design taking into account human and institutional aspects? Relatively simple designs fail to consider normal human actions, how humans interact with an object. Water rights legislation is embodied in structures, becoming point of contention, and different ministries are involved with different parts of water structures.

Discussion

Phil Woodhouse opened up the discussion by asking how we interpret scale - does it imply consensus? Democracy? Participation? Democratisation depends on how you define participation argued Esteban Castro. We have been discussing participation at the lower, grassroots level, i.e. making people participate and making them create their own systems, but we don't talk about it at the global level. Looking at the example of Brazil, participation at the grassroots worked its way up to government power. Participation may not always be positive, it may also have a dark side. Edmilson Teixeira commented that participation is needed to change power structures, but in the end, are those who participated in the beginning forgotten? And what type of democracy are we talking about? When you look at the structure of decision-making and policy, you need to discuss representation and sustained ability to convey interests. Esteban Castro followed up on this by saying that participation, beyond the everyday meaning, is actually dependent on the political context. A liberal democracy is based on the concept of participatory democracy – but who participates? The experts and the politicians. Often policies are reached through deliberative processes and are then rejected by those at the top, as is the case in Brazil. Water and sanitation services therefore may not always be participatory in Brazil.

Lyla Mehta picked up on the issue of unintended consequences, asking how small scale impacts can be made sense of. And how can individual social interests be interpreted? Bruce responded by saying that the scale of river basin management does scale down to individual small levels, and does incorporate the lower river management situations. The diversity is increased when you think about the different irrigation strategies that are needed for different crops. Rob Hope, picking up on the issue of the varied social interests at play, commented that the World Bank's demand-responsive approaches show that very few women are involved in decision-making processes. How do you balance the participation of women and children with the social/male dominance of financial power? In other contexts, it is about the quality of supply, or the quantity of supply – do you separate the policy side from the regulatory side? There are linkages to what Bronwen was talking about: the economic side is apolitical and doesn't address the power issues that Esteban spoke about. How do we balance between individual rights and social choice? Ingrid Nyborg observed that projects often include participatory elements in the engineering processes. Most of these projects deal with technical issues of how to distribute water within a social system, but how do you factor in other political and social issues? Bruce responded by acknowledging her point, saying that one can theorise about these ideas, but they have to be placed within a political context, relating how the marble-playing game he had talked about earlier could help reveal other relevant issues, such as e.g. food storage.

Brian Reed urged us to examine the role of engineers and how they cope with knowledges, illustrating his point through an example from a water project he had been involved in, which had tried to mainstream gender into the work. It didn't go well because the engineers weren't

interested – they had to change the project language, throwing away rights and gender-related concepts, and rewrite it in a way that was more compatible with the project engineers. There is a problem of dialogue, and it has to do with language, he said, arguing that we need to focus on how social scientists can make the engineer’s jobs easier. Edmilson Teixeira related how he had done his MA in the 80s, when one started talking about ecology and ecological management. But ecologists couldn’t talk to engineers, and though there has been a lot of advancement, social scientists still aren’t prepared to talk with engineers. Esteban Castro cautioned that we should be careful about over-generalising engineers – they can also use the language of rights (often called the blah blah engineers). The real issue is that we need to distinguish between our intellectual stances. There is a book called, “The Ghost of the Executed Engineer” that traces the history of what it means to be an engineer, from very focused applications (like engineering nails) to much broader (engineering citizenship through water systems). From a sociological perspective, the struggle over rights is essential, and might seem foreign to engineers, but is still relevant.

Bronwen Morgan then moved the discussion on to the topic of waste, asking Rob and Bruce to elaborate on waste and excessive use. She asked whether they could describe any differences between what water users and farmers wanted and what was given to them, and also asked whether this was a rights issue or a consumer rights issue?

Rob said that with alternative technologies, you can put in wells and protected streams, but what is poorly understood is users’ preferences, and unfortunately, donors find little room for blending technologies to meet the varied user demands. Is it water quality that users are after? Then are you looking at water source or water use? These issues will emerge if you go in with a preordained set of solutions. Bruce responded by saying that Bronwen had pin-pointed why he criticises IWRM, it proposes an overly formulaic approach to irrigation. Instead of preordained solutions, we should develop social space to allow a community to determine proper use and disposal. But framing those local rights and how they work with the larger basin needs is difficult, sometimes they need that external input given by mapping and GIS. Phil Woodhouse then rounded off the discussion by thanking everyone for a useful interdisciplinary dialogue

WAYS FORWARD FOR RESEARCH, POLICY AND PRACTICE

John Thompson, Frances Cleaver, Stephen Young

John Thompson introduced the two panellists in the final session, and went on to highlight some of the main issues running through all the sessions.

Frances Cleaver opened by reflecting on the nature of knowledge in water, and identifying gaps for future research. She focused on a range of different approaches and priorities. Academics working on water governance focus on dynamic political policies, the general principles that balance specific needs and the messy space between the two. By contrast policy-makers want to simplify the ideas, and produce no nuances, just solutions. Finally, those on the ground often do not want more studies, instead they are urging for action. Academics working on water are interested in the different nature of knowledge. Academic social scientists are uncertainty creators. Our job is to challenge and question mainstream ideas so we create uncertainty and complexity. Academics are uncertainty creators, whereas the policy-makers’ job is to reduce uncertainty. They want to simplify ideas. The practitioners are the negotiators of action, at the

interface of complexity, dealing with real people, manifestation of real people and complex interaction and at the same time uncertainties and action. We talk about deliberative forums, as if we can come together, speak, and come up with agreed paths. But how can we overcome difficult and different approaches? There is not enough attention given to these diverse interfaces to negotiate the different types of knowledge, knowledge demand and demand for action. Melissa reminded us in the beginning of the tension between oversimplification vs complexity. Somewhere in the pathways approach, we need both – we need the simple and the complex – but what do we need these approaches for? We need them for the big picture, to understand societal inequalities and gross misallocations of resources, especially if we are interested in transformation or equity of resources. But we also need the picture of local people working things out that takes into account agency. We need to hold both complexity and policy together. We need a 'public knowledge' that combines academic and instrumental knowledge together, that embraces a debate about societal goals. Research also needs to combine structure with agency and focus on how institutions deal with ambiguity and uncertainty and the different pathways to sustainability that include or exclude certain people/ perspectives.

Stephen Young asked how social perspectives of complexity and change can give rise to solutions on the ground. As a policy-maker, looking towards concrete outcomes, how can we make sense of these complexities? It is of course a complex picture to piece together; which fits with the STEPS agenda. How does examining the critical framing of arguments actually help us work most constructively together? When looking at policy challenges, climate change has been a big agenda for DFID which also has a renewed focus on water, focussing on both water resources, transboundary issues, international architecture and the right to sanitation and the focus on health. It is true though that we have been slow to respond to the urbanisation challenge. We are also seeking to translate risk and uncertainty into policy-making. Policy-making is a chaotic business, it is not about logical strains, it's never neat and easy, but always very complex. Are we now a society focusing on managing risk more effectively? Considering institutions, which are the ones that bring justice? Back to framing concepts, from the individual household level to health colleagues, to national level, helping politicians understand this. How do we get influence there? How do we take forward dialogues – the deliberative forums? We look ahead to the changes we are seeking to bring about, including at the international architecture. This brings together a range of stakeholders to influence these issues, and so thinking of framework for complexity will be a useful concept to take forward.

John Thompson rounded up by observing that the session was very much about bringing solutions through complexity. And while it may complexify things, it will hopefully create better ways of going forward and to think more about what is done to go forward. Scientists are good at coming up with answers, but not always good at coming up with questions. But it is essential to get the questions right.

CONCLUSION

Rather than creating complexity, social scientists are illuminating, elucidating and explaining – not creating, but revealing the complexity that is already there. The role of social scientists is indeed to uncover complexity but policy is not just chaotic: It is also political. It is only chaotic if you think that it is.

Still, there was consensus that even though there is tension between social scientists and hard scientists, we should rid ourselves of such distinctions. What is needed is for every kind of scientist to scale his or her knowledge to the issue at stake, it is not about some realities being more complex, but rather about framing how we deal with our different scientific ways of knowing. We are interested in the real world, and creating better opportunities for the less privileged than they have at the moment. What matters is social relationships, which includes the scientific community; a fascinating chance to work together. We have been stuck with an image of our scientists in far away cultures and now we have to look at how to engage with global issues that manifest themselves locally.

Working together across the disciplines is key. The obstacles are not unusual, knowledge becomes an obstacle to producing new knowledge; we need to destroy the knowledge we've already created. We need new observables, to make observable the processes that are not. We thus need to make visible that which might not be so visible, in ways that create more options and more possibilities for different people.

In sum, participants generally agreed that while the Symposium aired and shared diverse views, it was constructive and full of energy and passion. It is hopefully the beginning of further engaged debates bringing together critical and interdisciplinary perspectives on how to achieve pro poor and socially just sustainability in water and sanitation. We hope discussions summarised in this report will provide a starting point for continued conversations and collaboration, through sharing of resources, follow-up discussions, future conferences and research initiatives. Please join with us in taking this forward the debate.

APPENDIX I: STEPS WATER AND SANITATION PUBLICATIONS

(In chronological order)

Mehta, L., Marshall, F., Movik, S., Stirling, A., Shah, E., Smith, A. and Thompson, J. (2007) *Liquid Dynamics: challenges for sustainability in water and sanitation*, STEPS Working Paper 6, Brighton: STEPS Centre

Movik, S. (2009) *The Dynamics and Discourses of Water Allocation Reform in South Africa*, STEPS Working Paper 21, Brighton: STEPS Centre

Movik, S. and Mehta, L. (2009) *Going with the Flow? Directions of Innovation in the Water and Sanitation Domain*, STEPS Working Paper 29, Brighton: STEPS Centre

Marshall, F., Waldman, L., MacGregor, H., Mehta, L. and Randhawa, P. (2009) *On the Edge of Sustainability: Perspectives on Peri-urban Dynamics*, STEPS Working Paper 35, Brighton: STEPS Centre

Movik, S. and Mehta, L. (2010) *The Dynamics and Sustainability of Community-led Total Sanitation (CLTS): Mapping Challenges and Pathways*, STEPS Working Paper 37, Brighton: STEPS Centre

Thapa, S., Marshall, F. and Stagl, S. (2010) *Understanding Peri-urban Sustainability: The Role of the Resilience Approach*, STEPS Working Paper 38, Brighton: STEPS Centre

APPENDIX II: LIST OF PARTICIPANTS

Name	Affiliation
Abimbola Odumosu	UNICEF
Brian Reed	Water, Engineering and Development Centre (WEDC), Loughborough University
Bronwen Morgan	University of Bristol
Bruce Lankford	University of East Anglia
Cassandra Bergstrøm	Norwegian University of Life Sciences
Declan Conway	University of East Anglia
Edmilson Teixeira	Federal University of Espirito Santo – Brazil
Emily Polack	Institute of Development Studies
Fatema Rajabali	Eldis, Institute of Development Studies
Frances Cleaver	School of Oriental and African Studies (SOAS)
Gordon McGranahan	International Institute for Environment and Development (IIED)
Harriet Le Bris	STEPS Coordinator, Institute of Development Studies
Ingrid Nyborg	Norwegian University of Life Sciences
Jan Selby	University of Sussex
Jeremy Allouche	Institute of Development Studies
John Thompson	Institute of Development Studies
José Esteban Castro	University of Newcastle
Julia Day	STEPS Communications Manager, Institute of Development Studies

Kate Bayliss	School of Oriental and African Studies
Kirsten Hastrup	Professor of Anthropology, University of Copenhagen
Kristin Hamada	School of Oriental and African Studies (SOAS)
Laurence Smith	School of Oriental and African Studies (SOAS)
Linda Waldman	Institute of Development Studies
Lyla Mehta	Institute of Development Studies
Maggie Klousia	Institute of Development Studies
Mansoor Ali	Practical Action
Marcos Lopes	UFES/LabGest(Brazil) & UEA/DEV(UK)
Mark Dubois	The WorldFish Center
Melissa Leach	Institute of Development Studies
Merylyn Hedger	Institute of Development Studies
Naomi Vernon	Institute of Development Studies
Nathan Oxley	STEPS Communications Assistant, Institute of Development Studies
Peter Newborne	Overseas Development Institute (ODI)
Phero Kgomotso	Institute of Development Studies
Philip Woodhouse	University of Manchester
Rob Hope	Oxford Centre for Water Research, Oxford University
Robin de la Motte	University of Manchester
Roger Calow	Overseas Development Institute (ODI)
Sara Wolcott	Institute of Development Studies
Shai Andre Divon	Norwegian University of Life Sciences

Stephen Young	Department for International Development (DfID) – Policy and Research Division
Susann Trabert	University of Bayreuth
Synne Movik	Institute of Development Studies
Tom Slaymaker	WaterAid

APPENDIX III: SYMPOSIUM PROGRAMME

Day 1: Monday 2nd November

	Session	Speakers
15.00	Registration	
15.30	Welcome and Introductions Why Liquid Dynamics?	Melissa Leach and Lyla Mehta (IDS)
16.30	Climate change and uncertainty: emerging issues for water and sanitation	Chair and discussant: Roger Calow (ODI) Speakers: Declan Conway (UEA) Kirsten Hastrup (University of Copenhagen) Laurence Smith (SOAS) Merylyn Hedger (IDS)

Day 2: Tuesday 3rd November

	Session	Speakers
09.00	Meeting the challenge of Urbanisation and its peri-urban fringe	Chair and discussant: Tom Slaymaker (WaterAid) Speakers: Bronwen Morgan (University of Bristol) Jeremy Allouche (IDS) Gordon McGranahan (IIED) / Lyla Mehta (STEPS)
11.30	Sanitation and disease ecologies	Chair and discussant: Brian Reed (WEDC) Speakers: Ingrid Nyborg and Shai Divon (Norwegian University of Life Sciences) Synne Movik (IDS) Mansoor Ali (Practical Action) Peter Newborne (ODI)
14.00	Technologies, access rights and uncertainty	Chair and discussant: Phil Woodhouse (University of Manchester) Speakers: Esteban Castro (University of Newcastle) Rob Hope (Oxford Centre for Water Research)

		Bruce Lankford (UEA)
15.30 – 16.30	Ways forward for research, policy and practice	John Thompson (IDS), Frances Cleaver, Stephen Young (DFID) and others
16.30	Close	