

Transitioning urban water systems

Alison Duffy and Chris Jefferies

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Water managers acknowledge on a global scale that current practices are no longer sustainable and have an adverse impact on ecology (disruptions to the water cycle and habitats), public health (water qualities, sanitation services) and the economy (flooding, drought and overuse of resources). The idea of applying transitioning approaches stems from growing recognition that changes in water management are urgently needed. The SWITCH transitioning approach was developed by consolidating the project's existing stakeholder engagement approach with ideas on transition knowledge, an emerging new field of science.

Key concepts

| | |
|-----------------------------------|---|
| <i>Transition</i> | A transition is a process by which societies select, adopt and implement new systems and methodologies that break with existing practice. SWITCH could be said to have been seeking a transition from current systems to sustainable urban water systems. |
| <i>Transition management</i> | Intelligent, long-term planning through small steps based on learning and experimenting. |
| <i>Strategic niche management</i> | The creation of protected spaces for experiments and learning involving stakeholders. |

Introduction

One example of a transition is the shift we have made from conventional mailing services to electronic mail; a development that has radically transformed the ways in which we now communicate. A transition does not necessarily imply the immediate uptake of new innovations, but is more commonly a process where societies select, adopt and implement new systems and methodologies that are radically different from existing systems.

Transition management is described by transition researchers as a form of intelligent, long-term planning through small steps based on learning and experimenting. Transitioning should be an interactive, reflective and iterative process where the flow of knowledge is multi-directional allowing for interaction between technology users, decision makers and managers.

3.14

Sewer pipes convey wastewater from Tel Aviv for treatment and then all the way to the Negev desert to irrigate crops, Israel.
(Photo credit: Peter van der Steen)

Transitioning urban water systems

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Transitioning is necessary to achieve a more sustainable approach to urban water management. In the context of the SWITCH project a transition could be defined as ‘a radical switch from conventional socio-technical systems to next generation sustainable urban water systems’. The project can be considered a short-term global socio-technical transition experiment.

SWITCH transitioning framework

Towards the end of the project, the SWITCH transitioning framework was developed to consolidate the project approach to promoting and facilitating change. The framework provides a re-conceptualisation of how to promote change in urban water management drawing upon the project’s learning alliance model of stakeholder engagement, practical experiences in cities and new scientific thinking in the field of transition knowledge. The SWITCH transitioning framework encourages a systemic approach that takes the entire water system into account; with sustainable and integrated design and operation of all water networks (natural systems, water supply, sanitation and stormwater) being the ultimate goal or vision. The transition process is cyclical and aims to integrate, replace and transform existing complex socio-technical systems that increasingly incorporate a more adaptive and flexible management approach to resources and urban water systems.

Figure 3.14.1 SWITCH transition framework

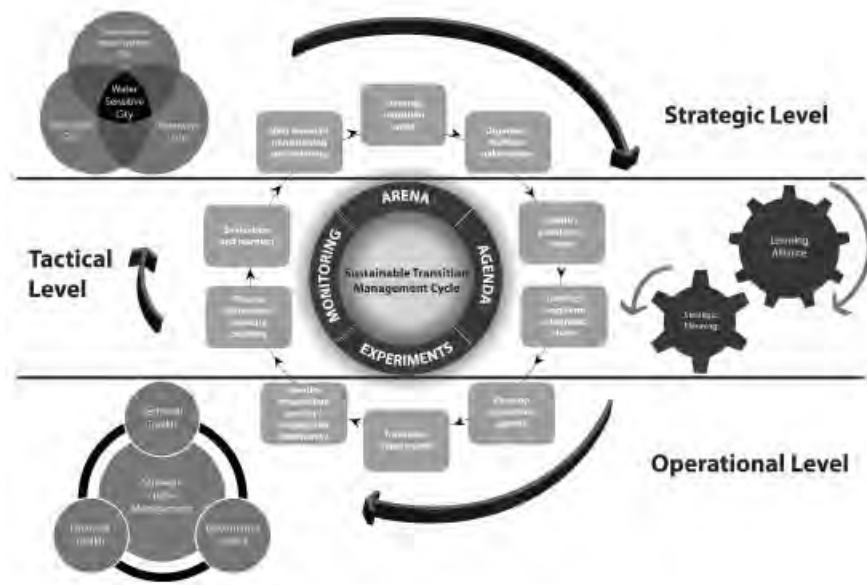


Figure 3.14.1 shows a transition management cycle consists of several steps that are aimed at influencing, organising and coordinating processes at three different governance or management levels (strategic, tactical, and operational). At the strategic level, visioning processes are developed, strategic discussions take place, long-term goals are formulated, collective goal and cultural norm setting is debated and long-term anticipation of innovative outcomes takes place. At the tactical level, short-term strategic goals of a vision are implemented and the transition agenda is developed. Societal sub-systems (the elements of the entire urban water system) are the focus at this level. At the operational level, short-term actions, experiments and innovation projects take place (Table 3.14.1). Developing and implementing new practices and methodologies generates niche environments for establishing new generation systems and improving the potential for scaling up. SWITCH learning alliances have operated in cities at all levels of this cycle, driving this process of change.

Different types of actors participate at each management level. A diverse set of competencies and skills are required across all levels. It is also necessary to acknowledge not only the influence of all actors on societal change processes but also to value the various perspectives and the diverse knowledge that can be used during all phases of the transition management process.

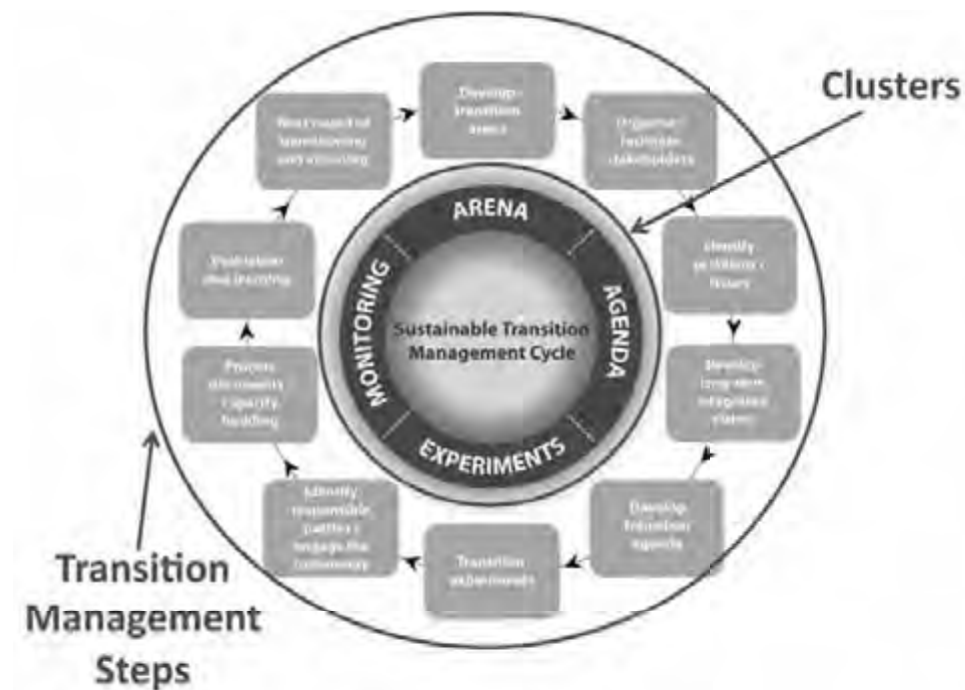
Table 3.14.1 Levels of activities in the transition management cycle (Loorbach 2007)

| | Problem Level | Time Scale | Systems Level |
|-------------|--------------------------|-----------------------|-------------------|
| Strategic | Abstract/societal system | Long-term (30 year) | System |
| Tactical | Institutions/regime | Mid-term (5-15 year) | Sub-system |
| Operational | Concrete/project | Short-term (0-5 year) | Niche/mini-system |

The SWITCH transitioning framework considers the city’s learning alliance as the motor driving the transition management process. Transition clusters are the key tools of the transition management cycle (Figure 3.14.2). The four transition clusters are:

1. arena: establishing the transition arena and problem structuring;
2. agenda: developing the strategic plan and sustainable pathways;
3. experiments: initiating and implementing innovations; and
4. monitoring: evaluating, monitoring and learning close the loop and deliver the cyclical aspect of the process

Figure 3.14.2 Transition Management Clusters and Steps. Adopted and adapted from Grin et al 2010



In SWITCH, the transition arena was called a learning alliance. Visioning and scenario-based strategic planning involved many aspects of the development of a transition agenda. Transition experiments refer to the science that was undertaken in the project and the demonstrations in cities involving learning alliances. Process documentation and city assessments in the project were key aspects of monitoring documentation of the change process, and helping learning alliance plan and re-plan their activities.

Transition management steps are the activities that define transition clusters (Box 3.14.1). In practice the transition management steps are likely to be carried out partially or completely, in sequence, in parallel or randomly. The methodology is not a prescriptive 'to-do list' and should not be followed as a step-by-step guide in the order provided in the transition manual.

Box 3.14.1 Transition management steps that constitute cluster activities

- Develop the transition arena
- Organise and facilitate stakeholders
- Identify water problems and issues
- Develop a long-term integrated vision
- Develop the transition agenda
- Experiment with transitioning
- Identify responsible parties, engage the community and brief the media
- Conduct capacity building/social learning activities/document the process of change
- Evaluate progress to benefit from 'learning by doing and doing by learning'
- Next round of transitioning and visioning

Strategic niche management

Strategic niche management is the creation of technological niches where stakeholders such as the members of a learning alliance provide space for experiments such as environmentally sound practices. These should be aligned with future visions so that they can develop, mature and eventually become embedded into the existing regime. Many types of socio-technical transitions happen as a result of niche development (Loorbach, 2007).

Using the transitioning framework

The SWITCH transition framework aims to be a 'road map' that is simple and easy to use. Its use is intended to facilitate a knowledge leap by communicating the pathways and tools available for encouraging the uptake of innovative practices and techniques that can guide or influence a transition towards the goal of more sustainable urban water systems. It can be used to better plan stakeholder engagement processes like those attempted by the SWITCH project.

Using the framework should encourage sector people to move away from conventional socio-technical urban water management pathways towards exploring pathways that offer more sustainable solutions. This should facilitate a mental shift encouraging the user to consider the possibilities of implementing next generation systems alongside conventional systems. The framework also focuses on learning, by applying a historically reflective, back-casting approach before looking forward to achieve long-term objectives. As new knowledge becomes available, re-evaluation and re-adjustment take place.


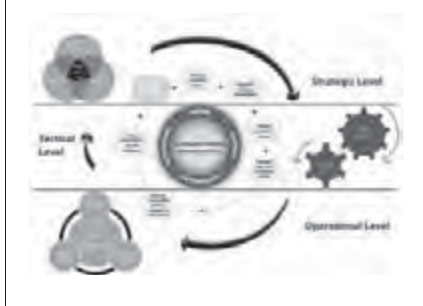
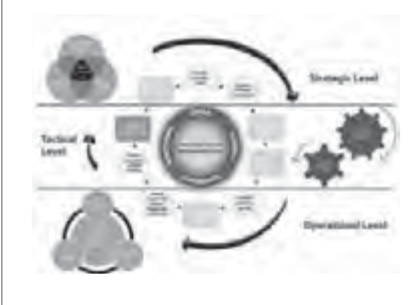
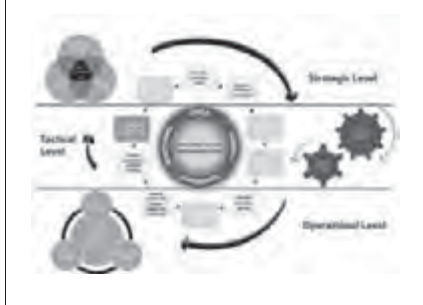
Transitioning Stories from four SWITCH Cities

Four SWITCH cities (Accra, Alexandria, Belo Horizonte and Lodz) were used to examine historical transitions in urban water systems to their current status, looking at how these cities have attempted to transition urban water management practices during the project, and identifying to what extent this was actually influenced by the project and its approach. Transition management strengths for the four cities are highlighted in Figure 3.14.3. SWITCH was only a five year project and the transitioning strengths gained during this timescale surpassed expectations in most cases. Arguably, Accra gained the most from learning alliance activities during the project, although an integrated urban water management trajectory is yet to be realised. This was primarily due to the way in which activities in the transition arena were embraced by the stakeholders and the facilitation capabilities provided. Alexandria had many delays in setting up the arena and implementing experiments. This made it difficult for the members in the arena to realise transitioning strength potential in the timescale available. However a trajectory towards integrated urban water management solutions has potentially been developed.

Belo Horizonte has a strong future orientation and already, since the 1990s, has had an environmental trajectory which focuses on integrated catchment planning as a strategy for delivering integrated urban water management. The learning alliance was able to build on existing opportunities to move this agenda forward. An institutionalised arena has been developed with the addition of key stakeholders who have helped strengthen a transition research agenda. Skills for evaluation and learning, an important part of the transition management cycle, were not however fully developed as part of SWITCH. Lodz also had an existing research trajectory with its sights set on integrated urban water management. SWITCH introduced a package of measures that assisted in developing transitioning strengths which resulted in breaking down barriers by forming a learning alliance that was capable of putting this agenda firmly into the institutional and public domain.

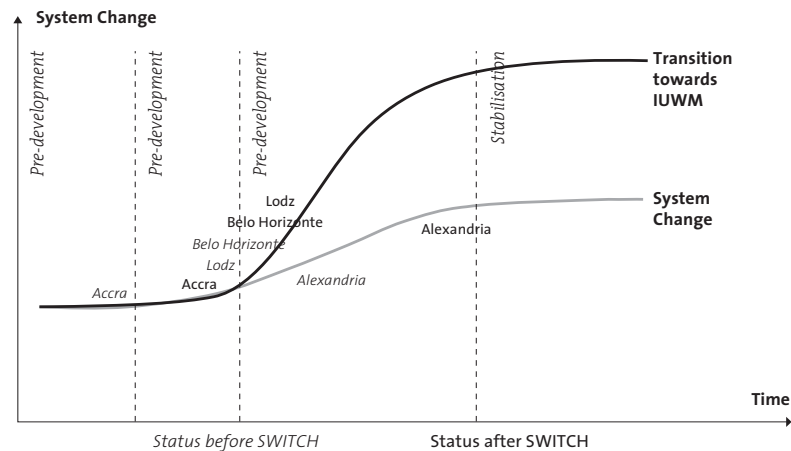
Significant movement along the ‘transition curve’ during the project was evident in all cities (Figure 3.14.4). Accra is poised to move into the take-off phase if the transition momentum instigated by SWITCH is sustained. Alexandria is technologically locked-in with culturally dominant stable infrastructures operated and managed by stakeholders who are rather resistant to change. However as a result of the strategic studies that were delivered through the project, stakeholders in the Alexandria city learning alliance have begun to realise just how unsustainable the water systems are in the light of additional pressures to which the city is likely to be exposed. The initiation of integrated strategies in Alexandria combined with a commitment to niche development through the proposed demonstrations is evidence of a desire to move towards more sustainable solutions. Both Accra and Alexandria have greatly benefitted from the transition strengths that they have gained during the project. The results of these processes has led to a clearer understanding of the issues (and costs related to these issues), barriers and constraints that they face as individual organisations and those which other stakeholders face as they attempt to improve their city for the future together; they are beginning to realise that together they can make a difference and reach the desired goal (a change in mindset is happening). Belo Horizonte and Lodz already had several strong transitioning strengths to build on and continue transitioning trajectories during the SWITCH project. Sustaining momentum is the biggest challenge for both cities.

Figure 3.14.3 Case Study Cities Transitioning Strengths gained during the SWITCH Project

| Accra Transitioning Strengths | Alexandria Transitioning Strengths |
|---|---|
|  <ul style="list-style-type: none"> • Transition arena developed • Key organisations and water issues identified • Improving service delivery vision, scenarios and transition agenda developed. Strategies identified to improve water supply and sanitation services • Responsible parties/stakeholders identified and media briefings to facilitate the vision and implement strategies • Process documentation, evaluation methodologies and capacity building programme developed to facilitate transitioning process <p>NEXT round of transitioning should focus on</p> <ul style="list-style-type: none"> • further experimentation with innovations |  <ul style="list-style-type: none"> • Key organisations and water issues clarified and documented • IUWM vision agreed with two further detailed visions for water supply and sanitation. Scenarios developed • Process documentation developed, responsible parties identified and media briefings to raise stakeholder and public awareness <p>NEXT round of transitioning should focus on</p> <ul style="list-style-type: none"> • Finalising and delivering the transition agenda • Implementation of transition experiments • Developing monitoring and evaluation methodologies |
| Belo Horizonte Transitioning Strengths | Lodz Transitioning Strengths |
|  <ul style="list-style-type: none"> • Vision developed with a strong focus on IUWM • Strong IUWM transition research agenda • Responsible parties/stakeholders identified • Strong media engagement encouraging ownership of innovative methodologies implemented • Process documentation and capacity building programme strengthened <p>NEXT round of transitioning should focus on</p> <ul style="list-style-type: none"> • Continue up-scaling innovations across the city and other municipalities. • Develop evaluation and learning methodologies |  <ul style="list-style-type: none"> • Transition arena strengthened with key players • Strong vision and IUWM transition research agenda • Transition agenda almost complete • Responsible parties/stakeholders identified and media briefings to go forward with the vision • Process documentation, capacity building, evaluation and learning programmes strengthened <p>NEXT round of transitioning should focus on</p> <ul style="list-style-type: none"> • Sustain up-scaling innovations across all rivers • Complete IUWRM transition agenda |

The transition trajectories are being driven by a more top-down approach in Accra and Alexandria and a more bottom-up approach in Belo Horizonte and Lodz.

Figure 3.14.4 Movement of SWITCH cities along the 'transition curve'



Progress in the case study cities was linked to the some key factors that strengthened the transition and strategic niche management processes:

- Full time learning alliance facilitation to organise stakeholders in the arena.
- Transition arenas with motivated champions who encouraged integration and generally led the group, helping to drive each stage of the process.
- A transition agenda that built on existing windows of opportunity (i.e. other projects and initiatives).
- Better progress where political buy-in and social inclusion were a part of the strategy.
- Active relationships nurtured between researchers and other stakeholders.
- Successful institutionalisation of the SWITCH approach at the regime level.
- Media involvement promoted to sustain the transition and pave the way for wider dissemination of the process to potentially facilitate scaling up within a city.

Some barriers to progress in the cities were identified as:

- Slow progress with overcoming challenges and barriers such as mobilising and motivating stakeholder collaboration.
- Delays to implementing research due to slow progress with initiating the transition arena and developing agendas.
- Lack of funding and activities that did not fit within the cultural norms of a city.
- Technological lock-in: Closed thinking inhibited the sharing of information and progress where infrastructure was firmly embedded and there was resistance to change by various sectors.
- Language barriers for effective global communication and knowledge transfer at the grass roots level.

Summary

The SWITCH transitioning framework is a result of analysing transition management concepts and key processes within the SWITCH project, especially the learning alliances within cities. The transitioning manual provides a guide that can be used to help design processes in cities to move towards more sustainable urban water management practices. Transitions are structural changes that are usually long term processes that occur due to the co-evolution of several societal, economical and technological processes.

The SWITCH transition framework is not a deterministic tool that can predict the course of a transition, since there are so many fundamental uncertainties surrounding not just transitioning but the concept of sustainability itself. However it provides a tool to analysis the underlying driving forces and mechanisms behind the processes and actions that may guide or influence change. The SWITCH project has been a short-term global socio-technical transition experiment. It has attempted to guide and even accelerate the co-evolutionary and participatory processes required to move the cities towards transitioning their urban water planning and operational practices in a very short timescale in transitioning terms. There are very positive results from the cities which have embraced the learning alliance approach: this is testimony that the potential to influence a change towards more sustainable outcomes through transitioning principles is possible and that the learning alliance is a successful vehicle for facilitating an urban water paradigm shift.

Using the SWITCH learning alliance approach as a practical example of applying the transition management cycle and strategic niche management concepts, the transitioning framework can be used to focus any city, regardless of location or cultural norms, on sustainable transition end goals. It should help to identify and analyse transition strengths and weaknesses in any city that is attempting to manage its urban water systems in a better way.

References

Grin, J., et al., 2010. *Transitions to sustainable development: New directions in the study of long term transformative change*. Knowledge Network on System Innovation and Sustainable Transitions. New York: Routledge.

Loorbach, D., 2007. *Transition management: New mode of governance for sustainable development*. PhD. Rotterdam: Erasmus University.

Related websites and further reading

SWITCH transitioning manual [Online] www.switchurbanwater.eu. This manual provides guidance on how to implement the SWITCH transitioning approach supported by examples from experiences in SWITCH cities. Four detailed case studies show how and why a transition is progressing in each city. Also included are transitioning toolkits based upon niche development in SWITCH cities. The manual is targeted at national and local level decision makers in the urban water sector including urban water practitioners and urban planners.

Managing the Transition of Urban Water Systems: SWITCH policy briefing note 4 http://switchurbanwater.lboro.ac.uk/outputs/pdfs/WP1-3_GEN_PBN_Managing_the_transition_of_urban_water_systems.pdf. This policy briefing note summarises the SWITCH transition approach.

The Dutch Knowledge Network for System innovation and Transitions www.ksinetwork.nl Provides resources on this new field of science where many researchers are working together to understand, identify and influence the process of transitions to a sustainable society.

[All websites accessed 13 June 2011]

Adrienne Martin is the Head of the Livelihoods and Institutions Group at the Natural Resources Institute and within the SWITCH project she focused on research on social inclusion. Email: a.m.martin@gre.ac.uk

Alberto Galvis coordinated the SWITCH project at the University of Valle and the learning alliance activities in Cali. He is a member of the Engineering Faculty at Cinara Institute and also a senior lecturer in Sanitary and Environmental Engineering and researcher in technology selection in water supply and pollution prevention and control. Email: alberto.galvis@correounivalle.edu.co

Alison Duffy is at the Urban Water Technology Centre, University of Abertay in Dundee, Scotland where she focuses on sustainable urban drainage systems. In SWITCH she worked on the development of the transitioning approach. Email: A.Duffy@abertay.ac.uk

Alistair Sutherland provided inputs on monitoring and evaluation and the documentation of the learning alliance process and analysis of changing perceptions of SWITCH consortium researchers and other stakeholders during the project. He is a Principal Research Officer at the Natural Resources Institute, UK. Recently, his work has focused on design and implementation of systems monitoring and evaluation, process documentation and assessment of early impact. Email: a.j.sutherland@gre.ac.uk

Avi Aharoni was the Tel Aviv City Coordinator, where he helped formulate a Final Report of Strategic Planning for the Urban Water Systems of Tel-Aviv-Yaffo. He was also the Project Manager of the research of Mekorot. Email: Aaharoni@MEKOROT.CO.IL

Avital Dror-Ehre facilitated SWITCH's activity of the "water club" - the learning alliance group in Tel-Aviv city. She finished her PhD which was multidisciplinary research combining nano-technology and water treatment, to face the challenge of controlling biofilm development by introducing silver nanoparticles in water. She is an expert in water and wastewater technologies. Email: avitald@raanana.muni.il or adrord@agri.huji.ac.il

Avner Adin is a Professor at the Hebrew University of Jerusalem and was the lead project researcher working on SWITCH research in Tel Aviv.

Bertha Darteh worked with KNUST as the facilitator for the Accra Learning Alliance; coordinating with stakeholders and SWITCH researchers to develop strategic directions for IUWM in the city. She is currently finalising her research on the use of a learning alliance approach for innovation in water management at the University of Greenwich. Email: berthadarteh@yahoo.co.uk

Björn Weber coordinated the learning alliance in Hamburg. As a scientific officer at the Climate Service Center Germany he is working on stakeholder involvement processes to transfer scientific results to other sectors of society. His technical focus is on sustainability in general and mitigation and adaptation towards changing environmental conditions in particular. Email: bjoern.weber@hzg.de

Contributors to the SWITCH in the city book

Cai Jianming coordinated SWITCH demonstration site on rainwater harvest and urban agriculture development in Beijing. He is a professor at the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, located in Beijing, China. He is also the coordinator of RUAF China on urban agriculture and sustainable city development. Email: caijm@igsnr.ac.cn

Carmen da Silva Wells supported learning alliance teams to document progress and challenges and looked into the changing perceptions within the SWITCH consortium of applying a multi-stakeholder approach. She is a Programme Officer at the IRC International Water and Sanitation Centre, working on various programmes which focus on multi-stakeholder learning for change. Email: dasilvawells@irc.nl

Cecilia Castro advised on implementation of learning alliances and capacity building activities oriented to reuse of treated wastewater for SWITCH project in Lima, Peru. She works as Senior Project Officer and Regional Adviser at IPES Promocion del Desarrollo Sostenible working at various projects related to urban agriculture, water and sanitation and other environmental management topics in Peru and other Latin American countries. Email: mcecilia_castro@yahoo.com or cecilia@ipes.org.pe

Charles Batchelor is a water resources management specialist and associate at the IRC International Water and Sanitation Centre. In SWITCH he supported several cities in developing scenario-based planning processes. Email: wrmltd@aol.com

Chris Jeffries is a Professor in Environmental Engineering at the University of Abertay in Dundee, Scotland and is head of the Urban Water Technology Centre. Email: C.Jeffries@abertay.ac.uk

Colin Green is a Professor of Water Economics at the Flood Hazard Research Centre at Middlesex University, London. In SWITCH he worked on governance issues preparing an overview report on governance a methodology for institutional mapping, guidelines for procedural equity, and inputs on how productive 'conversations' can be conducted between stakeholders and the scientific communities. Email: C.Green@mdx.ac.uk

Deirdre Casella is a Programme Officer at the IRC International Water and Sanitation Centre. She was involved in SWITCH in aspects of social inclusion research, development of activities in Alexandria and monitoring and evaluation approaches. Email: casella@irc.nl

Diana Alexandra Zambrano is a researcher at the Cinara institute in Cali, Colombia. Email: dialeza2@yahoo.es

Diana Paola Bernal was involved in the SWITCH project in Cali, Colombia from 2007 to 2009. She worked in the diagnosis of water management for the city and supported the consolidation process of the Learning Alliances. She is a sanitary engineer of Cinara - Universidad del Valle and currently she is following her PhD studies at the same university. Email: dipabesu@univelle.edu.co or dpaola22@hotmail.com

Emanuele Lobina is Principal Lecturer at the Public Services International Research Unit (PSIRU) of the Business School at University of Greenwich, UK. Emanuele researches and teaches water service reform and governance. He has been involved in several EU-funded projects such as Watertime, SWITCH, Govagua, the UNRISD-funded project on "Social Policy, Regulation and Private Sector Involvement in Water Supply. Email: e.lobina@gre.ac.uk

Ewen Le Borgne facilitated training courses and workshops around issues of process documentation, monitoring and learning and learning alliances. He is a Programme Officer at the IRC International Water and Sanitation Centre, working on knowledge management and multi-stakeholder learning for change. Email: leborgne@irc.nl

Geoff Denham was previously at Arup where he was involved in SWITCH managing inputs to support the Birmingham learning alliance.

Gunther Merzthal coordinated SWITCH's activities in Lima (Perú), while supervising and providing advice to the research, training and demonstration activities developed. He facilitated the national and local learning alliance created as part of SWITCH. He is a Programme Officer at the IPES Promocion del Desarrollo Sostenible located in Lima and at the International Network of Resource Centres in Urban Agriculture and Food Security (RUAF) located in Leusden (The Netherlands). Email: gunther@ipes.org.pe

Haim Cikurel is a Chemical and Environmental Engineer, with 38 years of expertise in research and engineering in municipal and industrial wastewater treatment technologies. He has been responsible for the scientific part in EU research projects since 1998 in Mekorot. In SWITCH he has been responsible for the short SAT -NF pilot and demo project and also a member of the Mekorot group who developed the 'water club' in Tel-Aviv and helped introduce water indicators in the strategic plan of the city. Email: hchikurel@mekorot.co.il

Henrietta Orei-Tutu is linked to KNUST in Kumasi, Ghana and in SWITCH supported activities in Accra.

Iwona Wagner is a Professor Assistant in the Department of Applied Ecology, University of Lodz, Deputy Director in the International Institute of Polish Academy of Sciences, European Regional Centre for Ecohydrology under the auspices of UNESCO. For several years she was the Secretary of the Ecohydrology Project of the UNESCO IHP, and a liaison for UNEP IETC. Iwona has been the City co-ordinator for Lodz in the SWITCH Project. Email: iwuwag@biol.uni.lodz.pl

Jacqueline Hoyer is a research associate at HafenCity University of Hamburg. She graduated in the field of landscape architecture and has worked for international research projects since 2007. In SWITCH she focused on research in the field of water sensitive urban design, notably on open space development as well as decentralised stormwater management. Email: jacqueline.hoyer@hcu-hamburg.de

Javier Celma is an Industrial Engineer with a Certificate in Environmental Engineering. He is the Director of the Environment and Sustainability of the Agency of Zaragoza City Council. Javier coordinated the SWITCH programme in Zaragoza. Email: unidadambiente@zaragoza.es

Jean de la Harpe prepared the Alexandria city assessment. She is the Programme Co-ordinator for the Southern Africa Regional Team of the IRC International Water and Sanitation Centre and specializes in water sector policy, governance and institutional arrangements. Email: harpe@irc.nl

Jennifer Chlebek facilitated the Birmingham Learning Alliance which included liaising with industry and academia, future scenario/strategy planning and dissemination of SWITCH outputs to the wider community. Jennifer Chlebek is a water engineer at Arup and specialises in flood risk analysis. Email: jennifer.chlebek@arup.com

Jeroen Warner is a political scientist, specialising in water issues. He published 'Stakeholder Platforms for Integrated Water Management', with Routledge in 2007. Jeroen currently works as Assistant Professor in Disaster Studies at Wageningen University and regularly cooperates with IRC. Email: jeroen.warner@wur.nl

Ji Wenhua is a facilitator of SWITCH-Beijing on rainwater harvesting and urban agriculture development. After graduating from the Institute of Geographic Sciences and Natural Resources Research (the Chinese Academy of Sciences), Ji Wenhua is now working as a teacher at Yun Nan Universtiy, located in Kunming, Yunnan Province, China. Email: jiwh.07b@igsnr.ac.cn

Jochen Eckart facilitated the SWITCH learning alliance in the demonstration city of Hamburg. He is an Urban Planner by training and is interested in the integration of urban water management and other urban services in the city of the future. Currently, he is working as a graduate research assistant at the School of Global Sustainability at the University of South Florida in Tampa. Email: jocheneckart@mail.usf.edu

Joep Verhagen has an urban planning background and has been working on issues around water and sanitation services delivery for the poor in Asia and Africa for the last 15 years. Within SWITCH, his main focus was on Accra and Social Inclusion. Email: verhagen@irc.nl

John Butterworth coordinated SWITCH's work on stakeholder engagement and provided backstopping support to the city teams. He is a Senior Programme Officer at the IRC International Water and Sanitation Centre located in The Hague, Netherlands but lives in and works from the city of Lodz, Poland. Email: butterworth@irc.nl

Khaled Abu-Zeid was the Alexandria City Coordinator for SWITCH. He is the Team Leader for the preparation of the "Alexandria 2037 Integrated Urban Water Management (IUWM) Strategic Plan", and the Project Manager for the Alexandria Fishermen's Village IUWM demonstration project. Email: kabuzeid@cedare.int

Kim Andersson is an environmental engineer who led the work in one of the research themes in the SWITCH Demonstration City of Cali, Colombia, for Cinara/Univalle. His specialty is sustainable sanitation with a focus on reuse. He is Swedish, and has many years of experience working with water and sanitation research and development projects in Latin America. Email: kim.j.andersson@hotmail.com

Lama El Hatow supported learning alliance activities in Alexandria, working for CEDARE in Cairo, Egypt.

Laura Cecilia Osorio is Mg in Environmental Management, and an Associate Professor of Environmental Studies at the IDEA-UNAL institute. Her line of research is about urban and municipal environmental management. She acted as the Director of the SWITCH project in UNAL from 2006. Email: licosoriomu@gmail.com

Marieke Adank is a Programme Officer at IRC International Water and Sanitation Centre. She is based in the Netherlands, but can often be found in Accra, Ghana, working on different projects and initiatives within the framework of IRC's Ghana programme. Within the SWITCH project, her focus was therefore logically on supporting the work in Accra, providing support to the city team, especially related to the Learning Alliance process and the strategic planning process. Email: adank@irc.nl

Melissa Herrera Badel is a Sanitary Engineer, who has been working in the application of SWITCH concepts in Cali, and has supported the learning alliances team. She is a member of Integrated Water Resources Management (IWRM) research group of CINARA-Universidad del Valle as Project Engineer, working in projects related to pollution control. Email: meliheba@yahoo.com.ar

Mike Morris was involved in the initial promotion of the learning alliance concept and guidance on the setting up of the alliances. He is presently a Social Development Adviser with WWF-UK, and continues to advocate social learning approaches to addressing the problems that stem from the Earth becoming an increasingly human-dominated system. Email: mikemorris_uk51@hotmail.com

Mohamed Elrawady is a Water Resources Specialist at CEDARE; he has over 9 years of experience in hydraulics, watershed management, coastal zone management, groundwater resources management, and numerical modeling. He is the SWITCH facilitator for the city of Alexandria. He has actively participated in the city's strategy studies and strategic planning. Email: melrawady@cedare.int

Monica Sanz has been the leader of the SWITCH Project in Bogotá focusing on social inclusion, on the implementation of preventive strategies and conflict resolution approaches for underprivileged communities impacting with their activities the Bogotá River. She is a PhD student at UNESCO-IHE, The Netherlands. Email: monicasz@gmail.com

Monika Dziegielewska-Geitz was the facilitator of the Lodz learning alliance and is a champion for the revitalization of the city. Email: empower_consulting@yahoo.de

Nilo de Oliveira Nascimento was the city coordinator of SWITCH in Belo Horizonte, Brazil. He is a Professor of Applied Hydrology at UFMG (Federal University of Minas Gerais) and his main research interests are in the fields of stormwater management, flood studies and use of economic instruments for water management in urban areas. Email: niloon@ehr.ufmg.br or niloon2000@yahoo.com.br

Patrick Moriarty is an engineer and water resource manager by background, with a strong interest in water governance issues. Since 2008 he has been based in Accra, Ghana, as director of IRC's Ghana programme. From there he has provided support to SWITCH in Accra, in particular the process of developing a widely shared strategic vision for the city based on a thorough understanding of the current situation of water resource use and water and sanitation service delivery. Email: moriarty@irc.nl

Peter McIntyre is a former newspaper journalist, now a writer, editor and trainer who works extensively in the water sector and also writes about health issues and ethical journalism. He likes to collaborate with content specialists so that their knowledge and insights become accessible to the widest possible audience. Email: petermcintyre@btconnect.com

Philip Sharp is an Independent Water Consultant and he carried out the role of City Coordinator for the Birmingham Learning Alliance for the first 3 years of SWITCH. Since 2009 Philip has been the International Facilitator for the Strategic Planning and Demonstrations in the City of Alexandria in Egypt. He also carried out City Assessments in Hamburg, Tel Aviv and Accra. Email: philip.sharp.uk@btinternet.com or Philipsharp@battusassociates.com

Rae Mackay coordinated development of the City Water Decision Support Tools for SWITCH and headed the research programme in Birmingham, UK. He is a Professor of Hydrogeology at the University of Birmingham. His research interests centre on modeling to improve the understanding of environmental systems. In May 2011 he will move to Monash University, Australia. Email: r.mackay@bham.ac.uk

René van Veenhuizen coordinated SWITCH's work on Productive Use of Urban Agriculture and provided backstopping support to the city teams in Accra, Beijing and Lima. He is a Senior Adviser on Urban Agriculture and Regional Food Systems at ETC AgriCulture located in Leusden, The Netherlands. René is also the Knowledge Manager of the RUA Foundation, and the Editor of the Urban Agriculture Magazine. Email: r.van.veenhuizen@etcnl.nl

Sônia Knauer was the facilitator of SWITCH Project in Belo Horizonte, Brazil. She worked directly with the Learning Alliance's process, being responsible for establishing the partnerships and for organising all events and courses offered by Belo Horizonte SWITCH Team. She is the currently Water Resources Manager for the Environment Secretariat at Belo Horizonte Municipality. Email: knauer@pbh.gov.br

Stef Smits is a programme officer at the IRC International Water and Sanitation Centre, amongst others responsible for IRC's Latin America Regional Programme. He has mainly been involved with the SWITCH work in the cities in Latin America, supporting the city assessments in Cali and Belo Horizonte, where he also did research on governance. In addition, he supported the city assessment in Zaragoza. Email: smits@irc.nl

Ton Schouten supported the process documentation in SWITCH. His background is in communication and innovation sciences but he spent most of his professional career working as a documentary film maker. He is a senior programme officer at IRC. Currently he is the director of the Triple-S (Sustainable Services at Scale) project. Email: schouten@irc.nl

Valerie Nelson supported SWITCH social inclusion activities while at the Natural Resources Institute at the University of Greenwich. Email: valairn@ntlworld.com

Victor Bueno Bernal has a Bachelor of Chemical Sciences, and is part of the Environment and Sustainability Agency of Zaragoza City Council. He is the Vice-Coordinator of the SWITCH programme in Zaragoza. Email: vbueno@zaragoza.es



SWITCH in the city

putting urban water management to the test

With more than half the planet's population living in urban areas, and rapid growth predicted, cities present a daunting test in water management. Their scale and concentrated populations provide a special challenge in providing water and sanitation services, creating a safe and pleasant environment, and handling wastes. As sustainability concerns have risen up the agenda, the challenge is for cities to do more, with less. To provide better services to all citizens, with less negative and more positive environment impacts on cities and their rural hinterlands.

The SWITCH project was a five year experiment focused on some of the key sustainability challenges in urban water management. In a number of cities around the globe, it set out to test what was needed for a transition to more sustainable urban water management through a combination of demand-led research, demonstration activities, multi-stakeholder learning and associated training and capacity building.

The book brings together the experiences of 12 cities involved in the SWITCH project from four continents (Accra, Alexandria, Beijing, Belo Horizonte, Birmingham, Bogotá, Cali, Hamburg, Lima, Lodz, Tel Aviv and Zaragoza) with a set of guidelines focused on promoting stakeholder engagement in such processes. It is targeted at people interested in undertaking demand-led research, promoting multi-stakeholder engagement, and scaling up research impacts, not only in urban water management but also in other areas where we find such complex and 'wicked' problems.

