
Reflection on the achievements and lessons from the SWITCH urban water management initiative in Lodz, Poland¹

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I. INTRODUCTION

Water and the city of Lodz

The presence of 18 waterways has been a key factor in the history of Lodz, a city whose very name means boat. These water resources were part of the reason why Lodz, located right in the centre of Poland, transformed itself from a provincial town to major manufacturing centre. Rapid industrialisation and the growth of the textile industry in the 19th century led to the city becoming known as 'the Polish Manchester'. However, the 1930s depression and transformations of the East-European economy in the 1980s twice decimated the markets for the city's textiles. None of the major textile enterprises are left and recently the population fell to reaching fewer than 800,000 inhabitants. Efforts to revitalise the city are again looking to water to provide inspiration. Streams polluted with sewage, that were once canalised and buried underground, are being restored. The city is once again searching for its rivers. An alliance of city managers, academics, activists, media and investors are aiming to unleash the power of these restored rivers as an attractive element for new urban development. Ecologically-focused restoration of rivers and associated green spaces contributes to a better quality of life and health for Lodz inhabitants, and reduces the risks of flooding, improves the water quality of streams and aquatic habitat, and spurs sustainable development and adaptation to climate change.

¹ Wagner, I. et al., 2010 *Reflection on the achievements and lessons from the SWITCH urban water management initiative in Łódź, Poland*. [online]. Available at: <http://www.irc.nl/page/58311> [Accessed 7 December 2010].

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Box 1. Water supply is not Lodz's biggest challenge

Water demand has fallen by more than half coinciding with the restructuring of the economy and a fall in population. Consumption is now 117 litres per capita per day (lpcd) and falling towards the EU average (100 lpcd) as a result of awareness raising campaigns to use water wisely. Almost all houses are metered. The city abstracts most of its water from wells near the Pilica River about 70 kms from the city. Diverse sources and alternative wells and intakes mean the supply is very secure, and quality is good because 90% is abstracted from groundwater. Drinking water is generally safe, although replacing old pipework is an ongoing challenge. Well-maintained public wells, handpumps and fountains in city parks and public places help make water visible in the city. Stormwater management poses much bigger challenges than water supply and municipal sewage management in the city.

Stormwater management is the biggest water challenge in Lodz nowadays. Large parts of the city have combined⁵ sewers that pollute rivers during storms, lower the treatment efficiency of the wastewater treatment plant (WWTP) during wet weather and lead to parts of the city being badly affected by flooding during storms. Disposal of severely polluted sewage sludge poses another problem. The SWITCH project is helping the City address some of these problems through demand-led research in two demonstration projects: the restoration of the Sokołówka river as an example of stormwater management, and research on the use of sludge to fertilise willow crops, a fast-growing dense wood that is used to produce energy.

SWITCH: An innovative approach to urban water science

The Sustainable Water Management Improves Tomorrow's Cities' Health (SWITCH) project is a major research partnership funded by the European Commission undertaking innovation in the area of integrated urban water management (IUWM). With a budget exceeding €20 million, SWITCH (2006-2010) has aimed to develop integrated research interventions and to support learning and sharing of lessons so that innovations can be scaled up and continue to be applied and sustained after the project. Many challenges in getting research results brought into use on a larger scale are related to issues of governance, financing and administration. To address these, the project established learning alliances to help focus the research agenda accurately on the needs of the cities and to promote the translation of research results on aspects of the urban water cycle into use to improve integration and to scale-up the impacts. These platforms are at the centre of the SWITCH approach, engaging relevant stakeholders and establishing linkages between researchers, knowledge managers and research users.

⁵ Combined sewers convey stormwater and domestic and industrial sewage through the same pipe network. In heavy rainfall, when the system cannot cope with increased flows, overflows include sewage as well as rainwater.

This assessment

In order to test the assumptions behind the project approach and to learn from city specific interventions, the project has undertaken process documentation⁶ at regular intervals. A joint reflection to assess and review the intervention logic and its effectiveness in each of the cities was undertaken in 2008 (Butterworth et al., 2008) and repeated in 2010. The first round of assessments focused on making the intervention logic in each of the cities explicit, mapping the initial outcomes of the project and making recommendations for improvement. These assessments were very well received as a method for critical self-reflection on the assumptions behind each of the cities' intervention logics and the expected impacts.

In 2010, with the end of the project approaching (the project officially ends in January 2011), a new process of assessment was conducted to:

- Identify lessons on the effectiveness of the intervention logic
- Recommend actions for the last year of project to achieve the project goals
- Identify mechanisms for scaling up and sustaining impact beyond the project life-span

This paper presents the results of the city assessment of Lodz. It offers insights for other SWITCH cities and similar initiatives that are aiming to bring 'research into use'. The main methods adopted for this assessment were:

- Reviews of project documents including progress reports, scientific reports etc.
- Interviews with selected key stakeholders
- Discussions within the project team, particularly between the city coordinator and the learning alliance facilitator. Methods to support this discussion included:
 - reflecting on the set of overall SWITCH indicators of success
 - a time-line exercise to review the order and importance of various activities (see section 3 for the result of that exercise) and
 - a review of the project team and learning alliance composition using a "gender and disciplines" matrix

The authors of this paper all have roles in the project: the learning alliance facilitator, the city coordinator in Lodz, external 'coaches' to the process. This makes us far from impartial; indeed we draw upon our experiences as 'agents-for-change' within the process. Following the best practice principles of process

⁶ Process documentation is a tool by which project staff and stakeholders track meaningful events in the project, register the paradigm change in the urban water management and reflect on how and why they happen. Process documentation is a systematic way to analyse and discover patterns that help or hinder change.

documentation (Schouten *et al.*, 2007) we have sought to be self-critical and reflective and to check our own perceptions and views.

The underlying scientific research from Lodz is well documented elsewhere (e.g., Zalewski, Wagner 2005; Wagner et al, 2008; Wagner, Zalewski 2009) and is not a major focus of this paper. This paper focuses on impacts of this research and how pilot interventions and the learning alliance process have influenced stakeholders, water management strategy and implementation within the city.

II. PROJECT METHODOLOGY IN LODZ

Urban water management science

SWITCH in Lodz has aimed to introduce a package of measures for *integrated urban water management* to reduce the effects of stormwater system inefficiency and to improve the quality of the urban environment by making Lodz's hidden rivers more accessible and attractive. Reduced peak flows from flash storms and reduced stormwater pollution will benefit rivers in Lodz and the wastewater treatment plant, as well as protecting the city and properties. Stabilising flows, lowering pollution levels in watercourses and restoring channels to more natural conditions will make waters safe for recreational use and improve the riverine ecology following targets set out in the EU water framework directive and contributing to sustainable development. The focus and scope of these measures has changed as the project followed its implementation path and the priorities of stakeholders emerged and today falls under the following topics:

- River restoration following ecohydrology⁷ principles
- Utilising sewage sludge (waste) as a productive resource
- Sustainable urban planning based on water and green resources for improving quality of life and attractiveness of the City.

Intervention logic

SWITCH aims to make a difference in the city of Lodz and beyond. The project intervention logic can be described under four hypotheses, which form the project's 'theory of change':

Improved monitoring and understanding of ecological and hydrological processes will lead to better comprehension of the role of rivers within management institutions and better designed management interventions

The project has put considerable effort and resources into surveys, monitoring systems and other research methodologies to understand fundamental ecological

⁷ Ecohydrology is an interdisciplinary field studying interactions between water and biota (organisms) within water bodies (e.g. rivers and lakes), or on land, and using these interactions for better management of water resources for the benefit of humans and environment.

and hydrological processes. This is intended to provide data and understanding to support for the development of evidence-based concepts, management and intervention options, and related decision making.

Urban water management demonstrations based on ecohydrology principles and a systems approach will lead to more effective and sustainable solutions that minimise environmental impacts

SWITCH encourages the better design of urban water systems. Applied design of innovative alternatives in demonstration projects as well as scaling up results and experiences have been piloted in collaboration between Lodz University and other city stakeholders.

Linking city stakeholders better to research, and better linking researchers to city planning and decision making processes, will lead to the identification of more effective research topics and scientific results that are more widely used within management agencies

The project team thought from the beginning about the use of research and how to scale up the technologies that were demonstrated to maximise impact. The learning alliance aimed to create conditions for productive stakeholder dialogue on goals, problems and solutions, so as to plan activities jointly, share results more widely and more quickly than is normal practice, and engage local and outside expertise in putting research into use.

Advocacy and public awareness activities will lead to a wider sense of ownership of urban rivers and lead to actions to use them in a sustainable manner

To build a wider alliance – beyond water professionals and immediate stakeholders – the SWITCH team in Lodz undertook a wide range of awareness raising and advocacy activities. These include engaging youth to raise their awareness of environmental issues and to create interest in the city's hidden rivers. The mass media, especially radio and newspapers, have also been engaged and over time the media contacted SWITCH project stakeholders independently of the learning alliance team. A website provides a central source of information on the project in Lodz (<http://switchLodz.wordpress.com/>).

Lodz learning alliance on urban water management

Researchers from the University of Lodz have been co-operating with the City of Lodz Office since the mid 1990s, and provided a good basis for joint work in the SWITCH project. Co-operation has been substantially enhanced since the establishment of the SWITCH learning alliance and the EU funds and project methodologies made available for its activities. This process started in March 2006, engaging initially the stakeholders perceived to have the most critical roles in water management. Over time, additional important actors have been identified and involved. In October 2006, a learning alliance facilitator was appointed by the university to support and coordinate the process. Some of the

main stakeholders engaged in the Lodz SWITCH learning alliance, and their roles, are included in **Box 2**.

The total budget for activities in Lodz of about €1,150,000 covered the costs to the university and to the City of Lodz Office⁸ for five years and includes a demonstration project budget of about € 700,000. Of the total, about € 130,000 has been invested in learning alliance activities. Most of the learning alliance budget was allocated for Lodz in the final two years of the project, in response to the increasing needs and number of activities proposed by the city management team and by learning alliance members. The SWITCH budget has financed the learning alliance facilitator and activity costs although there are also in-kind contributions from members, who provided meeting rooms for free and refreshments for participants, and from the voluntary work of PhD students. In addition to the learning alliance and city coordinator, staff from the university and from the European Regional Centre for Ecohydrology under the auspices of UNESCO in Lodz (ERCE) have been hired to support events or to help with meetings preparation or training. The learning facilitator and city coordinator received three training sessions each of 4-5 days to cover learning alliance facilitation and development, process documentation, and monitoring and evaluation.

Box 2. Some of the stakeholders in urban water management involved in the Lodz SWITCH learning alliance

City of Lodz Office (UML) is the key stakeholder and a key partner in the SWITCH Project. The *Department of Municipal Management* of the City Office has a number of important roles in water management. It issues permits in relation to activities that interfere with rivers like the laying of cables and pipes, and is responsible for the management of rivers and stormwater. The UML supervises the Lodz Infrastructure Company to whom the city's water and sanitation infrastructure is leased and the companies that supply water and treat wastewater. One project within the sub-department is the restoration of the Sokołówka river. Other important departments within the City Office are: the *Department of Environment and Agriculture* which issues water permits and plays a key role in environmental planning; the *Department of Strategy and Analysis*⁹ (now the *Bureau of Entrepreneurship, Development and Investor Relations*) involved in development strategy for the City, and with a unit focusing on revitalisation and long-term development. The Department has been particularly active in the last years of the project, when SWITCH results have clearly shown the value of using water resources as a basis for the sustainable planning of the City; the *Department of Spatial Planning and Architecture*; and the *Office for Spatial Planning of the City of Lodz* who amongst other things are preparing the Sokołówka local development plan, and are involved in the

⁸ The City Office in Lodz is the executive authority in the city, made up of officials. Lodz City Council is the elected body of councillors.

⁹ The name was changed during the progress of the SWITCH Project. For the sake of consistency in this paper we use the new name *Bureau of Entrepreneurship, Development and Investor Relations*, even though it did not use this name for much of the project period.

spatial planning for Lodz, which has been particularly important in the Blue-Green¹⁰ Network¹¹ development.

The *Lodz Infrastructure Company* (LSI) owns and develops the treatment plants and networks for water supply and sewerage in Lodz, but does not operate them. ZWiK (see next entry) operates the water and sanitation networks and supplies consumers, while GOS (see below) runs the wastewater treatment plant. The city is in the middle of a major programme funded by the EU cohesion fund to upgrade water and sanitation networks to improve water quality and reduce leakage and extend the sewerage network. Many of the roads and tram lines have been dug up and new sewers and water piping are being laid. Some sections of combined sewers in the city centre are being replaced to eliminate overflows of sewage into rivers.

The *Waterworks and Sewage System Company* (ZWiK) supplies water to consumers in Lodz (and Tomaszow Mazowiecki where nearby the main abstraction points are located) managing over 2,000 km of water and 1,600 km of sewage piping. The company manages water abstraction, treatment and supply to consumers, and maintains the sewage network (but it does not run the wastewater treatment plant). Recently, following flash floods, the company has taken on additional tasks related to the maintenance of the stormwater drainage system.

The Lodz Wastewater Treatment Plant (GOS) operates the wastewater treatment plant that treats all the sewage collected across the city. GOS is a key partner in the demonstration of sludge use for biomass production at willow plantations.

NGOs In 2009 several NGOs joined the Lodz learning alliance on the occasion of the Blue-Green Network development launch. They included among others: ZRODLA (The Centre for Environmental Activities), GPO (Group of Certain People), and 'Lodz on Bicycles' – NGOs involved in promoting environmental issues in Lodz.

The media have become an important partner for communicating the results of the project, and helping to raise awareness amongst Lodz inhabitants and change ways of thinking about rivers and their role in sustainable development.

Researchers: research institutes involved in the Lodz learning alliance include among others: Department of Applied Ecology of the University of Lodz, European Regional Centre for Ecohydrology under the auspices of UNESCO – the International Institute of the Polish Academy of Sciences, Technical University of Lodz, Medical University of Lodz, Institute of Occupational Medicine in Lodz.

Learning alliance activities

At the start of the project, water management in Lodz was focused on solving problems and meeting goals within separate organisations rather than meeting the city goals in an integrated way. Involving stakeholders in the learning alliance has been a crucial first step towards working together on solutions to problems.

¹⁰ See [Box 9](#) for an explanation of the Blue-Green Network

The learning alliance involved city stakeholders in vision and strategy development as a way of reaching a shared view on water problems, possible strategies and a shared vision for water and the environment in Lodz. Table 1 shows the major learning alliance activities to date. These are grouped following the four hypotheses which together represent the project's intervention logic in the city:

- 1) monitoring and surveys to improve understanding of ecohydrological processes
- 2) demonstration of innovations
- 3) learning and sharing within learning alliance to have wider impact
- 4) advocacy and dissemination to raise wider awareness
- 5) the facilitation and management activities that are vital to the SWITCH process in the city (a cross-cutting issue).

During the first two years, the learning alliance developed and trained a facilitation team, developed a website and communication mechanisms and hosted at least three major workshops on different urban water management research areas. The workshops were held with the curious, motivated and constructive participation of an expanding group of stakeholders. Each workshop extended the forum to a larger group identified by the participants in the initial stakeholder analysis and through the activities and discussions. Each of the workshops was run with the help of the methodologies learnt and developed by the SWITCH facilitation team, such as workshop documentation to capture progress and help take activities forwards.

At the beginning of the process, facilitation was based mostly on the existing contacts, face-to-face meetings with new contacts and members, and presentations of the project to potential learning alliance partners in the city and region especially at organised or external meetings. With time, more emphasis was put on organising dedicated meetings for all the learning alliance members (three or four times a year), and e-mail communication between them. At the same time, in order to assure the continuity of the process, learning alliance members involved in particular aspects of the project attended ad-hoc working meetings, There were often several meetings each week, with different groups and partners. After 2008, many of these meetings were initiated by the learning alliance partners and externally by actors such as decision makers, water managers, NGOs, media, scientists who were not involved originally in SWITCH). That might have been, to some extent, due to recognition of the role of the project by decision makers and water managers and due to the good relations built with the media and public through awareness activities to raise public interest in water and city restoration and to raise the profile of the SWITCH project. In 2009 and 2010 a wider audience of decision-makers, planners and architects became involved in meetings, workshops and presentations.

Year	Qtr	Monitoring and survey activities	Pilots	Learning activities in the city	Creating wider awareness	Behind the scenes facilitation and other activities
2006	1	Defined preliminary research scope and identified research partners	Started design of demonstration projects		Design and distribution of a first brochure about SWITCH activities in Lodz	Interviews, face-to-face meetings, presentations for identification of the core learning alliance members Presentation of the project concept: World Water Forum in Mexico
	2	Launch of the PhD research (Application of ecohydrology for urban river restoration ...) Establishment of monitoring stations and starting research activities on the demonstration sites	Start of construction of the Teresa Reservoir First Demonstration Activity Report – WWTP – state of Art	Scoping Meeting involving the members of the SWITCH Management Team and the core Lodz learning alliance members (first meeting with 12 members participating) Presentation of the Demonstration report to the learning alliance	Publication of an article in a local journal by the City Office, Necessary reanimation: Sokołówka river comes back	First draft of stakeholder analysis Key learning alliance members (8 members) identified Identification of further institutions to be invited to join Lodz learning alliance
	3	Launching of MSc theses in SWITCH	Development of a mathematical model of stormwater runoff and retention in the Sokołówka catchment	SWITCH Lodz presented at revitalisation conference		Developing an action plan to establish the learning alliance
	4			First annual RTD report (Sokołówka – monitoring and baseline studies) shared	Publication of conceptual journal paper on Ecohydrology – the use of water ecosystem processes for healthy Urban Environments.	Appointment of the learning alliance Facilitator Production of an integrated City Story Line
2007	1		Biomass harvesting at the energy producing willow plantation	Working meeting of the Lodz SWITCH learning alliance (30 participants) on stormwater management and GIS tools for decision support systems in urban water management		Presentation of the RTD report to the learning alliance Presentation and approval of the SWITCH Lodz Project goals and objectives to the Lodz City Council by the University of Lodz and ERCE Facilitation training for the SWITCH learning alliance facilitators (4 SWITCH cities)
	2		Tree surveys undertaken which served as the basis for the	Lodz City agree to co-operate in the EU Project Raindrop	Launching of the City Web-page and communication platform	Communication with the local media for assuring project

		creation of the Sokołówka Valley Park and its landscape design		Article in a national daily newspaper: "Lodz makes itself a river"	dissemination
		Establishing of the vegetation zone on the Teresa Reservoir		Publication of a paper in the local newspaper by the learning alliance member (City of Lodz Office): The rivers of Lodz and their restoration, Special issue of "The Municipal Review"	
		Establishing of new plots on the energetic willow plantation		Rivers of Lodz - photo exhibition organised with the NGO "Nudno"	
		Presentation of the decision support model on the wastewater treatment plant to the learning alliance		Presentation of the SWITCH project at the exhibition "Earth from Above".	
3	Start of PhD study (PCBs, PCDDs, and PCDFs concentrations in the Sulejow, Włocławek, Jeziorsko and Sokołówka reservoirs sediments and biota)			Preparation of 2 films, photographic and journalistic documentation (Gazeta Wyborcza) about the SWITCH in Lodz.	learning alliance Process Documentation training (involving over 50 participants from all the SWITCH cities)
				Two articles in the in Lodz edition of a national daily newspaper on SWITCH and process documentation workshop	
				Second brochure and poster "Sokołówka River Valley – Local Development Project"	
4	Launching of MSc theses in SWITCH Second annual RTD report	Biomass harvesting on the energetic willow plantation	Developers investing in the Sokołówka river valley contact learning alliance for more information and consultation; involving into the learning alliance activities	Final of the artistic competition for schools "Water in Lodz – the City of the Future" Film and TV broadcasts mentioning the SWITCH activities on the Ner river: "The green light for the Ner River"	Preparation to the Visioning Workshop – face to face meetings, letters and e-mail communication
2008	1	Preliminary design of the Sedimentation Chamber on the Sokołówka river Design of the Zabieniec reservoir completed	Presentation of the 2 years RTD results and consultation with the learning alliance (reporting session) Visioning workshop (about 60 learning alliance members and participants, including national level representatives) Presentation "... management plans for the Lodz rivers as a part of the Spatial Development Pan for the City" by ERCE to the City of Lodz		Presentation of the SWITCH 2nd year results to the learning alliance members: RTD, learning alliance, implementation, by all the involved learning alliance members and partners Setting the City Story line

2	Installation of On-line hydrological monitoring station	Second stage of the vegetation zone planting on the Teresa Reservoir	Use of learning alliance methodology in visioning for Lodz revitalisation – a conference on all the revitalisation aspects of the urban development, including water	Information table on the investments on the location of the Sokołówka river Demonstration Project.
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Table 1 **Some major activities in the process of the development of the Learning Alliance in SWITCH Project Lodz, Poland**

III. ASSESSMENT RESULTS AND DISCUSSION

Overall findings

In the last year of the five year SWITCH project, Lodz has implemented a well-balanced set of activities spanning research, demonstration, training and influencing stakeholders. Significant signs of the use of research results and their influence or impact can already be seen. According to Professor Maciej Zalewski, Director of the European Regional Centre for Ecohydrology under the auspices of UNESCO (ERCE), “SWITCH has completely changed how the city looks at water. This was apparent during the World Water Day official event, where water science and innovations were centre stage. The idea that water and green areas can be central in the future of Lodz has become an accepted view in the city, and this is as a result of the work done in SWITCH”. Elements from the SWITCH vision have been included in strategic documents developed by the City’s Bureau of Entrepreneurship, Development and Investor Relations. The ERCE team has made efforts to embed research results, concepts and recommendations into city strategies and plans. One example is the Blue-Green Network concept (See **Box 9**), which is also being used as advocacy tool by NGOs and through advice/ letters sent to the city council and the designers of the overall spatial plan for Lodz (Study of Conditions and Directions of Spatial Development of the City of Lodz). Some key findings from the assessment interviews (2010) about what learning alliance members see as the value of the SWITCH project are presented in **Box 3** below.

Box 3. Value of SWITCH

SWITCH has shown that there are alternative future scenarios that capitalise on the city’s green spaces, water and heritage instead of being a crossroads or a depository. (**Prof Zalewski**)

SWITCH brings technical innovations and the learning alliance has provided a chance for different city organizations to communicate and align their activities. SWITCH has given access to funds. It has allowed for the implementation of more comprehensive plans and avoided long delays. There is a clear time line, budget and activities in SWITCH, so there is an impetus for moving ahead despite the political process. It has also provided international examples, which can be used to inspire and inform people in the city. (**City of Lodz Office**)

From the beginning, we saw SWITCH as an opportunity to share our technical knowledge and experience, and provide information about our investments and plans. SWITCH also

contributes to the city's future... because it puts ... water and rivers on the city agenda. (**Lodz Infrastructure Company**).

Before SWITCH, we looked at water management mostly from a legal perspective. We have legislation regarding water supply, water quality and sewerage treatment, but implementation of laws is still weak. We became interested in the links between the regeneration of public spaces in Lodz and water. Water can really contribute to the quality of the city. SWITCH gave us information regarding sustainable development. Ideas about re-naturalisation of water and the Blue-Green Network have impacted on our work on spatial and strategic planning. Water and green spaces will contribute to sustainable innovations, solving social problems and local development. Elements from SWITCH visioning have been included in our strategic documents. Rivers will be the main element of the image of Lodz in our territorial positioning strategy. (**Bureau of Entrepreneurship, Development and Investor Relations**)

SWITCH has certainly made a difference in the city. Before 2005, there was almost no mention of green spaces or rivers in Lodz. The awareness around water is still less than for parks, however. (**Group of Certain People and "Lodz on Bicycles"**)

Scientific research in SWITCH

Assessing progress made against the intervention logic outlined above provides us with an understanding of achievements of SWITCH in Lodz. SWITCH has focused efforts and provided necessary resources (both financial and in terms of network of resource persons) to do applied research with visible tangible results.

Research within SWITCH has included:

- *Hydrological monitoring* of the Sokołówka river to develop a water budget and mathematical models for stormwater management. The results together with the findings of large-scale field experiments were used to design a patented Sedimentation-Biofiltration System for efficient purification of stormwater outflows.
- *Study of ecohydrological relationships* to design two stormwater reservoirs with increased pollution absorbing capacity.
- *Landscape survey of the Sokołówka Valley* to support the rehabilitation plan of the river valley and creation of the Sokołówka River Park.
- *Chemical analysis* of the seasonal and spatial distribution of persistent organic pollutants (POPs) (Urbaniak et al., 2008; 2009) and the dynamics of cyanobacterial toxins for use in risk assessment and prevention and management of water quality for safe recreational use.
- *Development of biomonitoring indicators* including assessment of fish assemblages and RNA/DNA ratio in fish tissues.

- *Research on the application of sewage sludge for biomass production* focused on three areas: 1) increasing the yield of bioenergy from willow crops, 2) using stabilised sewage sludge in deciduous ornamental shrub production and, 3) constructing a mathematical model as part of a decision support system for optimising sewage sludge use for biomass production, heavy metals removal, calculation of the optimal sludge dose and economic efficiency (Drobniewska 2008, Wagner et al., 2008).

Although the initial research topics were quite well defined before the learning alliance was established, the project team has tried to be flexible in responding to the needs expressed by learning alliance members and to support other organisations to make use of research findings and approaches beyond the initial project focus. Progress on the research is described in the following section.

Testing principles through pilots

Innovative methodologies for integrated and sustainable improvements in urban water management have been tested in demonstrations involving both researchers and research users. There are two major foci of the demonstration initiatives. The first involves river restoration based upon ecohydrology principles in the Sokołówka river valley that crosses the north of the city. The City Office Department of Infrastructure, advised by the University of Lodz, is re-engineering the river along more natural principles. The second focus of demonstrations has been to test the feasibility of reusing sewage sludge in the cultivation of willow as an energy crop.

Revitalisation of the Sokołówka Urban River Valley

The learning alliance has promoted learning, information sharing and awareness about river restoration through the demonstration of a series of technologies and interventions along the Sokołówka river. These included construction of reservoirs (one completed in 2006, one constructed in 2009, one under construction due to be finished at the end of 2010), and construction of a biofilter for stormwater purification (under construction) which was patented as a SWITCH innovation at the end of 2009. The project has led a wider plan for rehabilitation of the Sokołówka river (the concept finalised, technical project under development) and a plan for the development of a Sokołówka park (approved by the City Council). Figure 1 summarises these activities along the river.

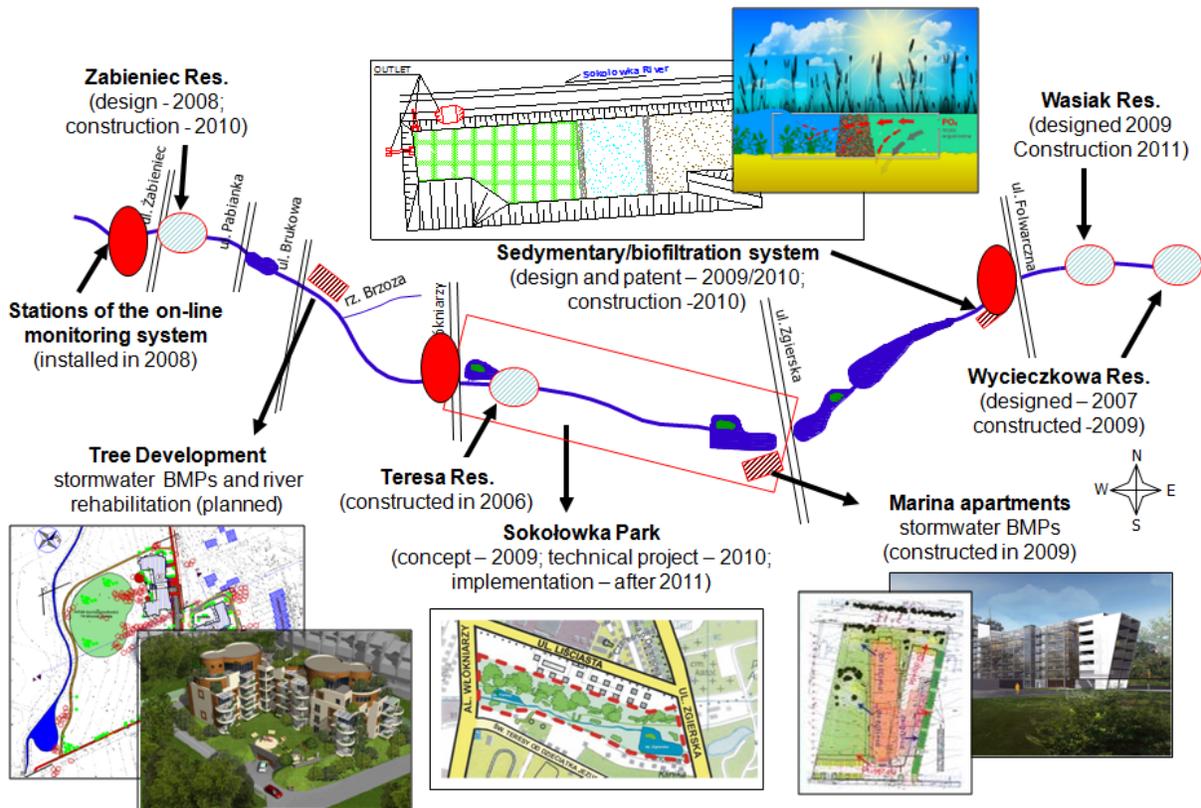


Figure 1 Interventions linked to the SWITCH Project in the Sokołówka river valley (constructed, under development and in design)

Source: European Regional Centre for Ecohydrology[ERCE], 2010.

SWITCH has been important in helping the city put practical innovations into use. The initial demonstration projects have generated new plans and spin-off activities related to river restoration that apply the concepts and designs piloted in SWITCH (as illustrated in **Boxes 4 and 5**). The project has led a wider plan for rehabilitation of the Sokołówka river and a plan for the development of a park.

Through sharing best management practices with developers, innovations are also being considered and used in the planning and design of new developments. In 2008 for example, a two developers in the Sokołówka river valley contacted the learning alliance with a view to implementing best management practices in stormwater at one of their new developments (see **Box 4**). One construction had already been developed with a system preventing stormwater from the new building located on the bank of the Sokołówka river from overloading the sewerage system; instead being contained and purified on site. The second developer faces problems securing necessary permissions, but the construction design adopts new trends in water and space development proposed by SWITCH (**Box 4**).

Box 4. Developer supports the Sokołówka river revitalisation project

The Tree Development Group - involved in major residential projects in Lodz - wanted to follow an ethical approach to providing homes in Lodz that are 'close to nature'. Having read news reports about the university's work on river restoration, the Tree Development Group contacted the SWITCH project for advice about a proposed residential project on land adjacent to the Sokołówka river. A small reservoir would be constructed on the river using ecohydrology design principles, improving views from the apartments at the same time as improving the river's capacity to purify itself and retain sediment from the reaching the Pabianka reservoir just downstream. In plans for a 300m stretch of river fronting the development, the developers also included a path near the river that would be open to walkers and cyclists. The original ideas for 'gardens' were also modified to make the landscaping and planting more natural and in line with the riparian setting. Trees on the site would be retained, and green roofs constructed on the apartments. Despite interest from the developers, little has been achieved since 2008, due to difficulty in obtaining the necessary permits.

Based on an interview with Wojciech Krasowski and Paweł Bernat, Tree Development Group property developers, Lodz, 2008

Box 5. Upgrading Water and Sewerage Networks: the Lodz Infrastructure Company

Lodz Infrastructure Company has participated in all SWITCH learning alliance meetings since the beginning and finds these very useful for sharing information and developing new initiatives. Through the demonstration projects on the Sokołówka river LSI has tested new approaches to improving water quality and improving the urban environment, and wants to replicate such river restoration activities across the 18 other rivers in the city. But there are challenges in doing this. The company knows how to do it, but lacks financial resources and capacity. It is not easy to find new sources of finance either. Developers don't want to pay – in fact they try to lever investments from the city – and it is hard to attract investors. EU funds play a critical role in upgrading infrastructure. LSI also sees that it is very hard to find funds for research, which itself takes a long time and is expensive. Really good specialists are also in short supply. SWITCH has been important in helping the company bring interesting and practical innovations into use. Over the past few years LSI has realised that every project is interdisciplinary and SWITCH is also helping address this issue.

Based on an interview with Teresa Woźniak (President), Konrad Kulawiak and Przemysław Wnuk, 2008.

Using sewage sludge to grow energy crops

The Lodz wastewater treatment plant receives and treats all of the city's sewage before discharging water into the Ner River and disposing of the remaining sludge to landfill. The company operating the plant is an independent government-owned enterprise. The company has been closely involved in research being undertaken by the University of Lodz on the use of sewage sludge for fertilizing biomass energy crops (see Box 5). Pilot plantations of willow have been cultivated by the company on municipal land next to their wastewater treatment plant (protective zone). A major

problem is the high level of heavy metal pollutants in the sludge. This issue is not easy to resolve because it requires action by the city authorities to control the pollution at source (i.e. the companies that are likely to be involved in pollution). It is impossible for the plant to meet the targets without actions being taken upstream by other stakeholders. SWITCH recognised that there was an important need to improve communication, trust and collaboration between the different agencies involved in sanitation.

As explained in **Box 6**, this demonstration was a good example of close cooperation between the university and city stakeholders. Biomass generated from the willow plantations is already being used as energy. More research is needed on costs and management options, and methods for using more sludge are currently being tested.

Box 6. Closing the nutrient cycle: using sewage sludge to grow energy crops

For four years Agata Drobniowska researched the use of sewage sludge and composted sludge as fertilisers for willow trees, for generation of biomass energy. Her research for SWITCH is different from that of many fellow PhD students at the university, who are mainly involved in laboratory testing of scientific properties and variables. Engagement with people at the wastewater company, the municipal office, private companies and her fellow citizens of Lodz has been a crucial aspect of her daily work. This has been time-consuming, but it has also helped her to gather knowledge about application of the concept beyond the initial pilot sites and to build good relations. Now her students are engaged on further studies on the potential to scale up this pilot.

There are still several constraints to scaling up implementation and some of these will be addressed in research beyond SWITCH. For example, the high concentrations of heavy metals in the sludge means that over 300 ha of plantations would be needed to use all the sludge produced, without violating national legislation. Methods for using more sludge are being tested. The costing model will be further researched beyond SWITCH.

In addition, the management and ownership options could be further developed. Information for landowners on how to access EU subsidies for planting energy crops is needed, while several legal and management hurdles also need to be tackled. To overcome these constraints, Agata Drobniowska suggests better monitoring of pollution and enforcement, developed through a working group with learning alliance members and in close cooperation with the lawyers of the plant. She also recognises the need to raise awareness and to explore options for EU financial support for farmers.

Agata Drobniowska feels that doing research in this way means she has to have a greater understanding of the complexity of reality. She hopes that this understanding will help to ensure that this research is applied in the real world. Fortunately, she has not worked alone, the SWITCH team has helped facilitate the process and to raise awareness. The wastewater company has also been very supportive. Besides assigning staff to work on the pilot, they also promote it in their public advocacy. For example, they promoted the research in two information films they produced independently of the SWITCH project. It is encouraging to see that this wider ownership of the research exists in Lodz.

Agata Drobniewska, University of Lodz, ERCE UNESCO, has completed her PhD studies on use of sewage sludge to fertilise willow plantations for energy production.

This assessment indicates that demonstrations have had an important role in making SWITCH visible in the city. They show people that things can be done differently, help to overcome resistance and are useful test cases for cooperation between different stakeholders. As the Bureau of Entrepreneurship, Development and Investor Relations put it, “While SWITCH has brought technical innovations, these are more about adapting design and developing new knowledge. Poland had experience with reservoirs before. The real change from SWITCH is the new and integrated approach to water management. Ecohydrology is really an innovative concept.” And according to Patricia from A Group of Certain People, “The pilot research has shown that they can be part of our living environment and that this improves the quality of life.” Local groups are now applying for green spaces in their area.

Two demonstration sites were due to be finished in 2010. Completing the demonstrations has high priority on the project team’s agenda.

Learning alliance

Assessing effectiveness of the learning alliance

The Lodz SWITCH learning alliance aimed to support a better understanding of the common water issues and key challenges in the city, and an improved demand-led research process with impacts on implementation and decision making processes. It was important to have ways to track and judge whether the approach is effective, but standard impact evaluation methods are not likely to be applicable. Learning alliances place emphasis on changes in perceptions, behaviours, and increased collaboration for scaling up. Two innovative methods of assessing effectiveness of the learning alliance used in Lodz that can capture these type of changes are scoring ladders (see **Box 7**) to assess mainly qualitative change (Sijbesma and Postma, 2008; Butterworth and Da Silva, 2008) and process documentation (Schouten *et al.*, 2007). A process documentation training course in Lodz in July 2007 made the approach available to the SWITCH project team in the city.

Box 7. Monitoring learning alliance outcomes

Indicators related to five objectives (four shared with other SWITCH cities and one added specifically to monitor issues related to social inclusion in Lodz) are being used to monitor learning alliance progress:

1. We know who learning alliance members are, and how to communicate with them effectively
2. Regular, effective and innovative events capture the interest of learning alliance members
3. Demonstration activities are undertaken within a framework for scaling-up
4. We understand why change is occurring in relation to integrated urban water

- management, not just what happens
5. Issues of social inclusion (gender, poverty and other marginalised groups) are systematically mainstreamed across all SWITCH activities in the city.

Through the city learning alliance, strong new linkages have been forged between scientists, decision makers and other key stakeholders creating the potential to scale up the use of research results. Alliance members from the City Office stated that, “The learning alliance has provided a platform for exchanging information and this is one of the most important results of SWITCH.”

This assessment has revealed a strong appreciation by city stakeholders of changes that the project has helped to achieve in the city. For example PhD Student Wojciech Fratzak stated, “SWITCH is a milestone project for the city, and for me as a researcher as well. It has made a difference in how water is managed in the city and how decisions are taken”. And according to the Bureau of Entrepreneurship, Development and Investor Relations, “SWITCH has introduced new vocabulary into our strategic planning process. We would like to see Lodz develop into the green capital of Poland”. According to ERCE Director Professor Zalewski the learning alliance process has been central to more integrated urban water management: “Thanks to the learning alliance and many meetings held through SWITCH, we are now at a point where our ideas are accepted by city stakeholders.” Over time, SWITCH has helped the Lodz infrastructure company realise the importance of ‘soft solutions’ like permeable surfaces and reservoirs that can complement more traditional hardware solutions like channels and pipes. Changes resulting from SWITCH relate to applied science and new concepts and to the uptake of concepts and joint development of recommendations by the learning alliance to relevant city stakeholders.

During the course of the project, the research focus has evolved and new elements have been added in response to local demands. By taking on new issues and challenges, the project has helped ensure that the city stakeholders feel that SWITCH can meet these demands. For example, stormwater issues did not initially feature in SWITCH research, but the SWITCH team picked up on interest in this area by city stakeholders. International stormwater expertise brought in through SWITCH was highly appreciated by SWITCH stakeholders. The meeting on stormwater management where a visiting consultant, Heiko Sieker (IPS, Berlin), provided practical examples was particularly well attended and improved cooperation between the university and ZWiK.

SWITCH in Lodz has taken on a broader focus than water management alone. The ERCE team has linked IUWM to broader issues of city revitalisation and city re-development. The former deputy mayor became a supporter of SWITCH ideas, contributing to wider visibility of the project and acceptance of the importance of water for the city’s future, as illustrated in **Box 8**.

Box 8. Integrating water and environmental issues with overall city re-development initiatives

The revitalisation of the city of Lodz has provided an excellent entry point for linking IUWM and SWITCH to wider processes of city development. Through involvement of the learning alliance facilitator, water and environment were brought into the agenda 'integrated city revitalisation' through a stronger focus on the city's 18 rivers and improving the quality of the water system. In 2006, the European Regional Centre for Ecohydrology presented itself and the SWITCH project at the Lodz 2023 conference, part of a series on city regeneration (www.vision-Lodz-2023.info). With over 100 participants, this conference brought together a diverse audience including city decision makers, developers, planners, architects, banks, private developers, heads of universities, journalists and 'creatives'¹². This shows how SWITCH can be effective by linking to existing events and initiatives or networks in the city. In April 2008, the links between water and city redevelopment were further strengthened at a city revitalisation conference dedicated to urban water and SWITCH. The deputy mayor expressed the importance of recognising water and green resources as key in the city's redevelopment. Several newspaper articles made mention of the conference and referred specifically to the importance of water for Lodz development. Media interest has continued, resulting in requests to ERCE for information and support on a range of initiatives to improve the city environment, for example requests from the Tree Development Group, and other NGOs.

The Blue-Green Network emerged during the course of the project as a framework that extended the initial scope of SWITCH to wider city development processes. The concept is to link development of a network of river systems and green areas as a basis for spatial planning and economic development. Through this framework, the ERCE team made an active effort to ensure that water was put on the city agenda and that innovations developed in SWITCH will be more widely applied in the future.

Box 9. The Blue-Green Network

In 2008, the idea of a Blue-Green Network in the city was developed by Prof. Maciej Zalewski and the team at ERCE. In February 2009 it was presented at a conference organised by the Mayor of Lodz, called "Lodz – the City of the Future". The concept is to link development of a network of (restored) river systems and green areas (agricultural areas, parks, wastelands and degraded areas) as a basis for spatial planning and economic development. Linking 'blue' and 'green' spaces could help to maintain the continuity of ecological processes and provide an integrated approach for:

- 1) Stormwater retention and purification through ecohydrological measures and ecosystem biotechnologies
- 2) Improving the city microclimate and flexible adaptation to global climate change
- 3) Improving health for city inhabitants (e.g., Kuprys-Lipińska et al., 2009)
- 4) Improving environmental quality in the urban space and lower management costs
- 5) Better conditions for developing zero-CO2-emission public transportation

¹² These are people with a sense of civic engagement who look for creative initiatives to building a greener, more social city. See Box 12.

6) Protection and revitalisation of the historical and cultural heritage of the city, and improvements in its attractiveness, aesthetics and quality of life

Information about the Blue-Green Network idea was disseminated to local media and has been presented in various meetings and local, regional and international events, including in 2009, at the SWITCH City Water Summit in Delft, World Water Week in Stockholm and the International Water Week in Singapore. In Lodz, meetings were held with a wide range of stakeholders and the idea captured local interest. One of the most important was the meeting in May 2009, when 50 people representing all the city's stakeholders involved in water and environmental management, gathered at the Department for Environmental Protection and Agriculture of the City of Lodz Office. The meeting resulted in elaboration of recommendations to one of the most important strategic City's documents: Study of Conditions and Directions of Spatial Development of the City of Lodz. An effort was also made to reach politicians through meetings with three City Council committees and other stakeholders participating in the Spatial planning of the City.

How the learning alliance has been sustained

The learning alliance process in Lodz goes much deeper than the meetings of learning alliance members. It has built on working relations between the host organisation and city authorities, with support from senior staff at ERCE and from city stakeholders. Keeping this process going takes resources, skills and dedicated staff. Experience in Lodz shows that establishing and sustaining a learning alliance requires the strengthening of existing networks and contacts (for example between ERCE and municipality), strong facilitation, trust building, frequent communication and the involvement of people at all levels. This includes frequent face to face meetings with key people focused on specific issues to ensure sufficient and sustained support from respected, well-connected and experienced senior people.

During the course of the project, the learning alliance process has become recognised as a fundamental element of SWITCH in Lodz. Repeated attendance by a committed core group of stakeholders, who valued having their voices heard, has resulted in active participation. Learning alliance events have helped stakeholders to gain a better understanding of the urban water cycle, jointly identify key problems and possible solutions, and to learn about the sometimes complex perspectives of the other stakeholders on key water issues. It has made them more aware of the importance of working together, across departmental and organisational divides. According to staff from the Bureau of Entrepreneurship, Development and Investors' Relations, "Taking part in the learning alliance has helped us to get an understanding of different views of different city departments, but also has brought us into contact with ideas from schools and NGOs. These ideas now inform our work in developing strategic plans."

The learning alliance is now seen as a place where stakeholders can constructively share their viewpoints and expertise. They see this process as contributing to a more efficient integrated management of water-related issues in Lodz. A big change that

has resulted from the learning alliance is, according to the same department, that people now understand that environmental and water management is not solely the business of the environmental department, but that city and transportation departments have crucial roles to play as well. **Box 10** illustrates some of the ways in which alliance members value the learning alliance.

Box 10 Stakeholder appreciation of the value of the learning alliance

The learning alliance is a very effective platform for ... the process of joint decision making. At first it took a lot of time and effort to get people together. But now, we have one meeting, with all the relevant people present, instead of having separate meetings with different stakeholders. And when everyone is at the same table, they have the same information and it is easier to move forward together. All agree that river restoration is a vital issue for the city. We can reach agreement sooner because of the learning alliance. **(PhD student, Wojciech Fraczk)**

People don't know about rivers in the city and don't think that things can be different. Although the structure of river management has not been changed fundamentally, SWITCH has helped achieve closer collaboration. And as a result of SWITCH, the city council now has sessions about water in Lodz. But, it takes the active involvement of people responsible for roads and for urban design too! **(Lodz Infrastructure Company)**

It is difficult to convince decision makers. But our research has resulted in change. The change is both in the way people think, but also in how things are done. Before SWITCH, people worked very much in their own department or organisation, the learning alliance and research have helped to improve the connections and to stimulate information sharing **(Former SWITCH PhD student, Agata Drobniowska)**

Through the learning alliance, NGOs were able to present their vision on 'green' in the city to the city offices. The brainstorming among NGOs has resulted in some new contacts. **(Patrycja Wojtaszczyk from Group of Certain People and Łukasz Kamiński from 'Lodz on Bicycles')**

There is an interest in a similar form of platform or network to continue to stimulate knowledge and information exchange and ever closer collaboration. For example, alliance members from the City Office stated that, "Communication between different offices and groups should continue so that lessons can be shared". The learning alliance process is seen as helpful in having developed a better and more integrated understanding of problems related to water management, and to help prioritise and develop more focused joint actions for the improvement of water management. Researchers have a vital role in providing data and information and learning alliance members have become ambassadors of ideas shared in the SWITCH learning alliance, using concepts like natural reservoirs, and the Blue-Green Network in their own presentations and discourse.

While learning alliance members agree on the importance of tackling water management in a more integrated way, it has been a challenge to get the active

commitment of top decision-makers to actively engage in the process and take ownership of problems related to water management. In 2010, the political landscape in Lodz changed dramatically. The Mayor of the city was replaced (following a referendum), followed by his Deputies, as well as most of the Directors of City Office departments involved in SWITCH. This was initially seen by the project managers as a threat to its continuity; fortunately, this worry appeared unjustified. From the very beginning of the project SWITCH has worked with representatives of stakeholders across all hierarchical levels, from city officers, lower professional staff, chiefs of sections and sub-departments, to directors of departments, the Mayor and national level officials. This work in establishing good working relationships, disseminating information, and the efficient involvement of people across all levels of management in participation in meetings and training sessions, helped the SWITCH process to continue without damage after this fundamental change. Moreover, the new City authorities are very well aware of the SWITCH processes and more than enthusiastic in supporting it and involving themselves actively in further activities. The proof is the strong support of the City Mayor to the Closing SWITCH Scientific Conference which took place in Lodz in October 2010, support for the public information campaign about stormwater, and joint meetings, including discussions with NGOs on the sustainable future of the City. The leaders of other institutions in the learning alliance are continuing lines of action developed by SWITCH, and are willing to get actively involved in new initiatives.

Visioning to set joint objectives

At the start of the project, water management in Lodz was based on isolated actions within separate organisations. The 2008 visioning workshop provided a foundation for identifying common goals which led to strategies towards a plan for integrated water management.

Box 11: Lodz vision 2038 for land and water “Lodz Uses Its Water Wisely”

Lodz vision is that by 2038 ‘Lodz Uses Its Water Wisely’. ‘The city’s resources management is based on an efficient and integrated system ensuring access to information for all. Investors and authorities respect ecological properties of land and waters. Infrastructure serves the functions and requirements of an environmentally secure city, is reliable, meets the needs of all of the city’s population and assures good status of aquatic ecosystems. Green areas - river valleys along open corridors – provide space for recreation and are the ‘green lungs’ of Lodz. The population’s common and in-depth ecological awareness contributes to exceptional quality of life. Our city is a leading centre for innovation, education and implementation in Poland.’

The visioning workshop in January 2008 brought together more than 60 participants representing 25 organisations and institutions, including top decision-makers and their ‘right hands’. Before this, the learning alliance was still in a phase of trust-building while stakeholders established the value of their participation in the project. Senior decision-makers and executives in these organisations had not yet actively

participated. However, when they understood the seriousness of the workshop goals they seemed not to want to miss a chance to express their views and emphasise their commitment and involvement in water management issues. Constructive discussions and group activities were key to success and there was evidence of a common willingness to contribute and seek specific changes, rather than to criticise and focus on the past. The SWITCH learning alliance has sought to encourage this positive attitude shift.

The workshop methodology was considered interesting, innovative and helpful. Participants expressed pride that Lodz has a vision for better urban water management and that they contributed to establishing it. Four 'scenarios'¹³ and number of strategic options for the vision achievements were elaborated by the learning alliance during the following meetings over the next two years. Short- and long-term strategies, goals, indicators and phases for activities based on these documents are now being formulated. These were addressed at a series of strategic planning workshops in 2010, leading to the start of the process of the preparation of a Strategic Document on Integrated Urban Water Resources Management for the City of Lodz. The meetings were jointly organised by the Bureau of Entrepreneurship, Development and Investor Relations of the City of Lodz and the Lodz SWITCH coordinators. Co-operation with Tel Aviv – a SWITCH City and a sister-city of Lodz, with experience in strategic planning – help to trigger this process.

The visioning process and the Learning Alliance process in general have proved highly useful for focusing and aligning stakeholders in the paradigm shift towards integrated urban water management. The process marked a change in involvement and commitment of learning alliance members: it led to an increase in the participation of learning alliance members in the development of SWITCH documents, and in providing information and active support for SWITCH concepts beyond the learning alliance meetings. In addition, the methodology was adopted for a visioning process focusing on a wider issue than water management: the revitalisation of the city as whole especially its historic and neglected ex-industrial zones. Some aspects identified in the vision have been already followed up by stakeholders, although the production of coherent strategic document is still in progress. Examples include: attempts to implement best practice in stormwater management in new investments by government and private investors, recommendations for the spatial plans for Lodz, establishment of four new parks within the Blue-Green Network framework within the last year, fundraising for other river rehabilitation schemes and increasing the overall awareness about the ecological approaches.

The team, together with the Emscher Region SWITCH Partner in Germany organised several seminars for urban planners, architects, landscape architects, engineers and

¹³ Scenarios are descriptions of how achieving of vision in the future may look, based on different circumstances, for example, climate change or economic situation. They are used during the strategic planning process to identify the best way forward to achieve the vision.

developers about best management practices in stormwater management, to strengthen this approach in the city.

Water in city planning processes

Although not originally planned, SWITCH has developed activities in city planning that have proved vital to the uptake and implementation of integrated urban water management at scale. SWITCH has supported visioning, and scenario-based planning by the learning alliance, and is linking to official planning processes. The Blue-Green Network has been taken up by the city management and stakeholders as a basis for sustainable development in Lodz. This is a clear example of uptake and sustainability of concepts developed in SWITCH.

The concept of a Blue-Green Network has been embraced by city inhabitants NGOs and decision makers, and has been incorporated in the City Spatial Plan (under development) together with the concept of best management practices in stormwater management. Thanks to the broad dissemination of the concept and visibility of SWITCH, some architects and several NGOs approached UL and ERCE to get information on the concept and become involved into their further implementation, promotion and development. **Box 12** illustrates how ERCE has tried to build relations with stakeholders involved in urban design. While there have been some encouraging steps, **Box 13** describes how the practical uptake of innovations is (potentially) constrained by institutional divides.

Box 12. Beyond SWITCH: Influencing urban design

The SWITCH learning alliance has been an important platform to bring together a wide group of forces and stakeholders involved in water management, and the Tree Development Group has participated in two of the events of date. Wojciech Krasowski likes the clear focus on urban rivers and its orientation towards finding better solutions. Although it is necessary at times to have strong support at the highest level, he says that it seems effective when it involves middle-level management. As an example, he says that staff working in the local government will not take risks easily and this all too often means producing nothing new, different or innovative. But learning alliance events can open people's minds. He also said it is only possible to move forwards if architects, developers, environmentalists, planners etc. work together more closely, and he would like to see similar kinds of platforms on wider issues. Finding sustainable ways to develop homes that are nice to live in and that contribute to the Lodz economy is an issue that is broader than water.

The ERCE team have tried to forge linkages with young 'creatives' in the city. "They are the ones who are taking initiatives to restore the heritage and looking for new solutions for a greener more social city; people who have a sense of civic engagement and want to use innovations in their work for the city." According to SWITCH learning alliance facilitator Monika Dziegielewska-Geitz, to make SWITCH 'stick' you need to look beyond promoting SWITCH and water only through conventional channels. There are many creatives who can come up with unconventional solutions. Two examples of such connections are the recent contacts with MOOMOO architects and with links developed with the Tree Development Group and NGOs.

Based on interviews with Paweł Bernat and Wojciech Krasowski who work for the developers Tree Development Group (2008) and with Łukasz Pastuszka and Jakub Majewski who work for MOOMOO architects (2010)

Box 13. Potential and constraints in scaling-up good ideas: River Jasien

The River Jasien flows through an old ex-industrial part of the city (Księży Młyn) which is currently a major focus of redevelopment in Lodz due to its historic factory buildings being converted to lofts, offices and other uses and its location close to the city centre. The river is partly channelised and partly buried underground. It is badly polluted and receives untreated sewage from combined sewers. Building upon the river restoration efforts in the Sokołówka, the SWITCH team in the city was contacted to see whether this urban river could also be improved. The contact came in a roundabout way. Last summer, the learning alliance facilitator Monika Dziegielewska-Geitz went to Italy as part of a group interested in learning about conservation and restoration of art and heritage. Through people involved in this visit, Monika got in touch with a developer (MegaDex) involved in converting an old factory to loft apartments and who had heard about the efforts to restore the Sokołówka. The land happened to be next to a stretch of the River Jasien and the people involved were inspired to try and use restoration of the river as a catalyst to improving the local area. They developed an ambitious vision that was presented at the Lodz Revitalization Conference in April 2008 to try and interest decision makers.

Water quality monitoring was identified as a vital need to enable detailed planning of options for a watercourse that is badly polluted and could present health risks to the public and their animals. This is where the initiative hit a wall and has stalled to date. The water quality monitoring that is needed is costly (50-100,000 Zloty – €12,500-€25,000 for monthly monitoring over a year) and although ERCE could do such monitoring it hasn't been possible to find anyone to pay for it. The river doesn't belong to MegaDex and they don't want to pay the whole cost when there are wider benefits for the city. The Municipal Department of the city office does not see it as their problem. The river technically belongs to the Marshall's office (a regional institution) and a proposal might be submitted to them. The Lodz Infrastructure Company might also be interested to participate in the restoration process.

The lesson learnt in this case is that scaling up of innovations in urban water management is unlikely to be automatic and means more work. The learning alliance provides a forum to keep this initiative on the table and to try and take it forwards. This requires a lot of time, good coordination of all the stakeholders and skills. It has become fundamental to assure the sustainability of the learning alliance after the SWITCH Project finishes. ERCE has made a bid to take over the co-ordination of the learning alliance after 2011, through the funds raised recently within the EU LIFE + Project.

The importance of champions

To bring SWITCH onto the agenda of regional stakeholders has been complicated by tensions between the Voivodship (Province) and the municipality. There is a big gap in information between these two levels. The SWITCH team has taking steps to bridge this information gap through the learning alliance. At the beginning of the project the Voivodship was recognised as a stakeholder that should be involved, but political

tensions, and the fact that the initiative was focused on the City rather than at regional level, were the main reasons for this not happening. There is an expectation that the new wave of young people that have come into positions of power in the city will pave the way for change in the future. According to the ERCE team another very important political shift is the transfer of the former assistant Marshall to the position of President (Mayor) of the city, which could make it easier to build the cooperation between Lodz city and the surrounding Voivodship in the future.

Existing good relations between the Director of ERCE, supplemented by persistent efforts of the facilitator, have been instrumental in gaining support from key stakeholders in the city. In the 1990s Professor Zalewski was already advising the municipality to rehabilitate rivers. While there was some slowly-building support for this idea and plans got drafted, there was also resistance. The Mayor was supportive, but the proposal was not politically rewarding before SWITCH. The project provided leverage through funding for pilot projects on river restoration, natural treatment of wastewater and the reuse of sludge. The funding helped overcome some of the objections to these plans. The professor says that the “learning alliance approach helps change people’s mindsets, but this doesn’t happen in just two or three meetings. It is a process that takes time.” SWITCH has brought greater awareness of IUWM and both the project and the learning alliance concept have made a strong contribution to developments in Lodz. For example, the emphasis on innovation is something he views very positively. The main challenge he says is informing people and changing their attitudes. A lot of resistance towards ideas like wetlands restoration is based on inaccurate information and bad experiences of what engineers did in the past.

Communication within the Learning Alliance

In a project aiming to bring research and research uptake closer together, it is important to focus on increasing interest, trust and collaboration between stakeholders. Initially, communication was through formal letters to the heads of department, or managers, and meetings between a small core group of stakeholders. At the beginning, most learning alliance members sent representatives from lower levels of the hierarchy, junior managers, inspectors etc. Over time recognition of the project increased, aided by its progress including training courses and constructive meetings, public speeches from the deputy Mayor and media coverage. The visioning workshop in January 2008 succeeded in catching the interest of most of the key senior representatives.

Between 2008 and 2010 calls and emails from the ERCE team to learning alliance members were more swiftly answered and it became much easier to schedule meetings. Several meetings were called by the learning alliance members themselves, especially when talking about specific issues related to water in Lodz. Some of the learning alliance members have also shown the initiative to take over the organisation of some events, e.g., World Water day in 2009 (ZWiK); Strategic Planning Workshop

(Department of Strategy and Analysis – now the Bureau of Entrepreneurship, Development and Investors' Relations, UML); and a proposed competition for Schools on stormwater best management practices (LSI). MSc students have benefited from contacts and trust established over the five years, making it easier for them to access relevant organisations and data.

The core SWITCH team now uses various means to communicate with learning alliance members. Official correspondence is through fax and telephone, while all reports and proceedings are sent by email and posted on the weblog which is also used for announcements. Some contacts and appointments are made through Facebook. A database of addresses has been circulated to all members. In 2009, the Centre engaged a PhD student to update the website. Maintenance of the webpage after the SWITCH project finishes will be important for the continuation of learning alliance communication. It will be supported from the Funds of the Life + project.

There are also noticeable changes in how learning alliance members communicate during events. At the initial meetings, many people did not know each other and they behaved formally. Some people did not participate easily in discussions, especially during workshops. Most people were passively absorbing information, but reluctant to speak. During coffee breaks, people did not mingle or speak to people they had not met yet. Over time, people started to recognise each other and through facilitation methods like world café and small group discussions, poster group work, were stimulated to actively contribute. In this way, an atmosphere of openness has been built and this has been a major change: during the visioning workshop especially, it was hard to get the people to stop talking! Over time, learning alliance members have become more comfortable about speaking on behalf of their organisations and taking part in discussions. The facilitator states that people have become eager to focus on the positive contribution that they could make to SWITCH and have actively suggested initiatives that go beyond SWITCH.

By 2009, a change also became apparent in the dynamics of stakeholder interactions and communication between the SWITCH team and learning alliance members. While in the first two years, it was mainly the team (facilitator and co-ordinator) who initiated communications and put a lot of effort into meeting people and initiating activities. By 2009 various city stakeholders, including NGOs, media and officials started contacting the SWITCH team for advice and with ideas for activities.

As shown in **Boxes 3 and 10** alliance members express an appreciation for the learning alliance and for SWITCH. The learning alliance facilitator mentions that stakeholders have said that they choose SWITCH over other events 'because we know you make an effort to make it interesting and useful'. There has been positive feedback both about the content information provided and facilitation methods used.

The facilitator has actively involved PhD students in the facilitation of the learning alliance meetings and training new trainers, which also contributes to further dissemination of learning alliance methodologies. However, she has noticed that junior researchers often felt like they are working for SWITCH rather than being full members of the learning alliance. She has tried to use the learning alliance methodology to promote the idea of sharing as equals. Consciously eliciting their responses to their interactions has brought new insights and encouraged the team of researchers to share their experiences about the process rather than just the results of their research. The learning alliance methodology has been also used for classes with students at the University of Lodz, so that it is further disseminated to future professionals.

Current incentives for researchers are still mainly connected with opportunities to write and publish research reports and papers. However, the researchers involved in the Lodz learning alliance indicated that despite the extra work, they felt it was useful to engage with city stakeholders because they can see that the results of their work are appreciated and used by authorities in the implementation plans/decision making.

Raising awareness in the wider community

The project has also consciously tried to involve a wider group of stakeholders than the learning alliance. During the first year of the project, awareness raising activities included presentations and distribution of informative brochures to potential learning alliance members and city officials. After the first year, local media were actively brought into the process and became members of the learning alliance. In 2007, two films were produced by independent producers on the wastewater treatment plant and the Ner River initiative, using information generated by the SWITCH project. Additionally, two films were produced during the Process Documentation training course, and other two were produced by the SWITCH Project (Ecohydrology for the City of the Future – about SWITCH achievements in Lodz and its upscaling and “Grey to Green” – about technology for converting sewage sludge into bioenergy). Advocacy was also directed towards politicians. For example, meetings were held with City Council Commissions to inform them about problems and solutions related to stormwater management and the spatial planning and its importance for the city.

Engagement with schools, the media and politicians has resulted in wider awareness of the value of water for the city and support for SWITCH innovations. For example the idea of the Blue-Green Network is now widely known among and supported by city administrators. It features in the spatial plan (although it has been modified significantly) and water has been included in strategy documents. The media have been a real catalyst for the project and the learning alliance in Lodz. During the course of the project, many newspaper articles, press releases and interviews for TV and radio were produced. This raised the credibility of SWITCH and also raised people’s awareness of issues around water management. Meetings with politicians resulted in

a consensus that greater coordination of activities was needed immediately. Improving the quality of water and environment to improve the quality of living is now recognised as a priority. The City Council's Commissions agreed that instructions in planning documents regarding the use of water and river valleys should be formulated. They have been formulated and submitted to be included in the Study of Conditions and Directions of Spatial Development of the City of Lodz.

Communication and education activities in the final year of the project have included plans for an educational campaign, including among other things, a short advertisement to be screened for a month in cinemas before all the main feature films, radio and outdoor advertisements and a dedicated website. Campaigns related to stormwater management and the Blue-Green Network were planned to target the general public, developers, architects and decision makers. Key learning alliance stakeholders have been invited to take part in these endeavours. In 2010, short walkways with billboards outlining the demonstration project and a map were constructed (one at Sokołówka and one on the plantation) as educational paths based on the SWITCH demonstration projects. These ideas have been supported by the new City Mayor. A communication strategy for the project should ideally be linked to the learning alliance approach, and closer collaboration with the city office.

Creating opportunities for international exchange

One great benefit of an international project like SWITCH is that it can provide opportunities to share ideas and learn lessons from elsewhere. This was realised in Lodz in two ways: the participation of international experts from the SWITCH Consortium in events in Lodz and international exchanges of learning alliance members. In attracting international experts to Lodz, the strongest links were made with Stormwater Management where UK scientists and German practitioners strongly supported the Lodz learning alliance in providing information on stormwater best management practices and experiences from other regions and cities. It was also possible to organise two practical workshops on the application of mathematical models for selecting best management practices, where Lodz learning alliance members actively took part. This contact was crucial in exposing the learning alliance members and the City Council to examples of safe and working solutions in stormwater, which seriously accelerated the process of accepting new ideas and formulating recommendations for design and planning. Lodz has also invited specialists from natural systems (IHE), and spatial planning (Hamburg) for a special workshop for learning alliance members and developers. International exchanges included learning alliance members participating in two technical visits and meetings focused on stormwater best management practices and natural system implementation in Germany and the Netherlands. Learning alliance members participated in the Zaragoza Expo, the Tel Aviv and Delft SWITCH Scientific meetings, Tel Aviv Strategic Planning Meeting, Delft City Future Summit and the final SWITCH Scientific Conference "Sustainable Water management Improves Tomorrow's Cities' Health: achievements and way forward", held in Lodz in October 2010. International

knowledge exchanges were highly valued by Lodz stakeholders, strengthening learning alliance members' commitment to the project, and significantly helping to build a broader more active project team. Learning alliance facilitator Monika Dziegielewska-Geitz, says that international exposure helped to get SWITCH on city stakeholders' agenda. "There's real ownership now. It's not us pulling. The learning alliance members are ready and want to work on strategy analysis."

Sustainability and expectations for the future

Dissemination of SWITCH concepts and research results

Efforts continue to disseminate SWITCH work on embedding integrated urban water management concepts into bodies outside the learning alliance that are responsible for planning and operations. In early 2009, a session for high level decision makers was organised on stormwater management and best management practices. As a result of this meeting, recommendations regarding sustainable stormwater management were submitted to the Commission for Spatial Development of the City Council of Lodz and were included in the Study of Conditions and Directions of Spatial Development of the City of Lodz. Recommendations regarding sustainable stormwater management for new construction were passed to relevant authorities, and are on their way to becoming official guidelines for stormwater control in new investments (see Box 14).

Another good example of the efforts to embed SWITCH and give the project coherence is the plan for training on strategy development.

Box 14 Meeting city innovations demands: Stormwater management

Several activities were undertaken to advocate for sustainable solutions for stormwater management. In April 2009 a 'breakthrough' meeting was held at the Waterworks and Sewage Company, with key decision-makers. Dr Heiko Sieker (IPS, Berlin), a stormwater consultant, was invited as international expert. The meeting ended with the following conclusions and recommendations:

1. Develop demonstration projects for sustainable stormwater management on public sites, which will serve educational models. An application to the City Council to identify such sites should be submitted. Attempts to obtain funding for the demonstrations from other sources should be made by ERCE, Lodz Infrastructure Company and ZWiK; *This is under implementation in the Life + project. Other opportunities are being identified;*
2. Submit recommendations the Study of Conditions and Directions of Spatial Development of the City of Lodz; *This was developed by ERCE in consultation with the meeting participants, submitted to and included in the document after adaptations;*
3. Formulate instructions regarding stormwater management within the Sports-Recreation-Conference Centre and include them in the instructions for the project tender. *This was developed by ERCE in consultation with the meeting participants;*
4. Formulate instructions for stormwater management for new investments. *This is under development;*

5. Submit a letter of request for and organising a Special City Council Session on stormwater management in Lodz. *The session was organised after the consultations with the Mayor and the Chairman of the City Council.*

Next steps, spin-offs and future expectations

There are various activities that embed environmental issues in the city that may have been sparked off by SWITCH but which are driven by learning alliance members and by other organisations and individuals. There is evidence for continued collaboration with stakeholders on river-related issues beyond SWITCH.

The University of Lodz has developed a clear strategy to continue and expand the work done in SWITCH and to continue to apply the learning alliance concept to bridge the gap between science and practice. This includes securing funds from the EU for new projects that will build on the research and have a strong component of communication and dissemination.

One tangible impact of the SWITCH demonstrations was a joint application¹⁴ by some learning alliance members for EU funding for the LIFE+ project EHREK for the revitalisation of one of the City's major rivers and recreational areas (the Bzura River and Arturowek reservoirs). Department of Applied Ecology of the University of Lodz, as the coordinator of this process, together with the City Office and Lodz Infrastructure Company as the major co-beneficiaries, have secured funding and will work with the regional authority over the next five years to improve the quality of water and improve the attractiveness health and environmental security of this popular recreational area. The solutions proposed for implementation in the LIFE + project are based on innovations and experiences and on ideas that come from SWITCH. The project will also continue to work with and support the Lodz learning alliance, on dissemination of project results, influencing decision-making processes, upscaling and securing funds for rehabilitation of more rivers in Lodz.

Box 15 summarises major the spin-offs of the 5 years of the SWITCH and learning alliance activities in Lodz.

Box 15 SWITCH Spin-offs

1. New projects: Uł and ERCE, jointly with other LA members (The City of Lodz Office, Lodz Infrastructure Company, others) applied for and have received new EC research and implementation projects building on the SWITCH experience:
- EHREK: Ecohydrologic rehabilitation of recreational reservoirs "Arturówek" (Lodz) as a model approach to rehabilitation of urban reservoirs (LIFE PLUS, LIFE08 ENV/PL/000517); to

¹⁴ Ecohydrologic rehabilitation of recreational reservoirs "Arturówek" (Łódź) as a model approach to rehabilitation of urban reservoirs (LIFE+, LIFE08 ENV/PL/000517).

provide funds for implementation of the SWITCH innovations in important city's recreational area and secure funds for LA continuity;

- EKOROB: Ecotones for Reducing Diffusion Pollution (LIFE08 ENV/PL/000519) upscale application of the learning alliance methodology for better management of a catchment area (9258 km²) supplying Lodz with drinking water;

- GPPinfoNET The Green Public Procurement Information Network (LIFE07 INF/IT/000410) attempts to integrate BMPs in stormwater management into the system of public procurement for further city's development and uses learning alliance facilitation methods;

2. Blue-Green Network spin-offs:

- Further research on the Blue-Green Network and its implementation in Lodz has been supported by a research project of the City of Lodz Mayor: Geobotanical and sociological valorisation and delimitation of natural habitats in Lodz as a requirement for functional and spatial sustainable development (Ed.VII.4346/G-19/2009 z 12.08.2009);

- Four new parks have been established by the City Council within the last two years, within the proposed Blue-Green Network;

- The Blue-Green Network concept has been included in City strategic documents (Study of Conditions and Directions of Spatial Development of the City of Lodz and others) and rivers start to play a more central role in other City's strategic documents;

3. Co-operation between research and practitioners: Researchers have been regularly invited by decision makers to advise on water related issues (e.g., Elaboration of recommendations for development and management of all river valleys of Lodz by ERCE);

4. Expanding the scope of SWITCH demonstration: Demonstration projects within the scope of SWITCH have been expanded with originally unplanned activities, e.g., building of other reservoirs and implementation of SWITCH-generated innovations on the Sokołówka river (construction of Wycieczkowa Reservoir and Biofiltration-Sedimentary System);

5. Developers, Architects and City Planning Activities:

- Some leading developers in Lodz have made attempts to apply best management practices in stormwater management as well as consider ecological settings while planning their investments (e.g., Wilkocki Project, Tree Development, Megadex);

- SWITCH demonstration activities inspired the interest of MOOMOO Architects, a young group who attended SWITCH workshops and expressed a willingness for future collaboration on design involving water recycling technologies and BMPs in designing houses and landscape.

- Professor Zalewski had been invited to the EC1 Advisory Board, EC1 being a major regeneration project planned for the city centre.

- In 2008 a meeting on the prospects of the Jasień river revitalization in the Księży Młyn area inspired the production of a set of instructions in the spatial development plan regarding the steps leading to creating a recreation zone linked to larger revitalisation process. In October 2010, the second meeting was held initiating launch of the Księży Młyn Alliance for Integrated Restoration, with the revitalization of the river Jasień as an axis and a catalyst for the process. The spin-off is seen as a possible extension of the Learning Alliance focused on river restoration.

6. NGOs:

- SWITCH has linked up with the activities of local NGOs inspiring collaborations on the design of the Blue-Green network and bike routes within it, such as “Lodz on Bikes” (“Rowerowa Lodz”), GPO (“A Group of Certain People”), “Źródła”, “NUD-NO”.
- SWITCH has been one of the proponents of the “Green courtyards” initiative by affiliating with the “Nasze ZOO” Foundation. The idea has been to inspire the application of water recycling technologies as well as solutions to paving the courtyards with materials for better infiltration.

IV. LESSONS LEARNED AND RECOMMENDATIONS

The dedicated efforts of the team at the Department of Applied Ecology in the University of Lodz (DAE UŁ) and ERCE managed to get water management on the city agenda by linking it to wider issues of city revitalisation, and spatial planning through the concept of Blue-Green Network. SWITCH in Lodz has managed to develop a good balance of activities – research, demonstrations, well-facilitated learning alliance events and activities, and awareness raising among a wider audience. Good project management was combined with flexibility and creativity in addressing city stakeholders’ interests and information needs. The combination of energy and resources put into the learning alliance processes were crucial elements of success. SWITCH in Lodz has engaged a critical mass of organisations. This combination has worked well.

International linkages

- The international opportunities that have been created for learning and networking through the SWITCH project have been widely appreciated by city stakeholders. Experts from other cities and consortium partners have regularly visited the city and provided different perspectives and valuable inputs and helped to identify important gaps. In this sense the project came at a good time, when the city was open to new ideas from elsewhere in Europe and further afield. Involving Lodz based staff in visits to other cities and conferences strengthened their involvement in the project and led to more effective team work and collaboration on returning home.

Learning Alliance

- The learning alliance is valued as a useful platform for information sharing, improving coordination and getting water on the agendas of city stakeholders. Learning alliance activities and events helped stakeholders gain a better understanding of water issues, focus on what needs to be done and generate new ideas on how this can be done in a more integrated way.

- It is clear that strong facilitation methodology developed and offered within the project was crucial to get attention of all the learning alliance members and assure their active involvement in the process and their ownership of the concepts and ideas that were elaborated. Strong facilitation is also needed to sustain such a process. Support from champions in the city and adequate resources were also key elements of the success of the Lodz alliance.
- Several factors seemed to contribute to the sustainability of the learning alliance: Building on existing networks and contacts helped to establish the trust and collaboration needed to deliver tangible/visible results early in the project. Awareness-raising for stakeholders outside the learning alliance helped raise the profile of the project and increase public awareness of SWITCH concepts. Involving operational level staff and more senior decision-makers was an important strategy to overcome the challenge of political transition.

Demonstrations

- The demonstration projects have an important role in making SWITCH visible in the city. They have proven to be an effective way to show new solutions and are useful test cases for cooperation between different stakeholders. In this regard, they are also key elements of the strategy to scale-up new implementations and enhance dissemination.

Uptake

- SWITCH has catalysed a process of change that is likely to continue after the end of the project. There is now a wide acceptance that water and green areas have an important role to play in the future of Lodz. Direct involvement of multiple municipal departments has been an important feature in uptake of SWITCH concepts.
- Several activities (demonstrations, training, dissemination) were planned for the final period of the project with the potential to further consolidate SWITCH research and collaborative thinking. Interest in 'green and blue' spaces in the city has increased and new initiatives have developed as spin-offs.

Gaps and recommendations for future work

The Lodz experiences show also, that a number of issues can slow or block the development of ideas developed in the learning alliance and by stakeholders in the city and hinder their transition into practice, or affect the sustainability of ways of working. These recommendations identify activities and areas of work needed to ensure that the change movement that developed around SWITCH continues to grow in Lodz.

- *Address the economic and institutional impacts of interventions and consider potential unintended consequences:* Research in SWITCH Lodz has had a focus on ecohydrology, while research on finances and social exclusion issues have remain underdeveloped. All interventions including river restoration have the potential to create unintended consequences and may exclude parts of society unless inclusion is addressed specifically.
- *Create incentives:* Find more and better incentives to increase involvement by researchers and ensure incentives and support for the project team to follow through right to the end of the project. Look actively for opportunities to continue beyond SWITCH.
- *Create and maintain innovative information methods and channels:* It is a challenge to find ways to satisfy all stakeholders' needs for information and meeting their goals through common agenda and vision, once their initial interest in SWITCH themes has been sparked.
- *Link to wider policy/regulatory framework and authorities:* SWITCH Lodz has focused mainly on the city, while legal/ policy frameworks and national level interactions are needed to support change at city level. Closer links with the regional authorities are needed.
- *Win over reluctant alliance members:* Despite best efforts it proved impossible to involve some key departments within the City Office. It is important to win over, for example, those responsible for roads and transportation infrastructure development.
- *Build on the visioning process:* Stakeholders identified strategy development as an important step in consolidating SWITCH and involving key decision makers in the city. Strategic planning could describe a city road map and be a lasting legacy of the project.
- *Sustainability of the learning alliance:* Learning is unfortunately all too often seen as a luxury and not always a necessary item for investment. However, it is likely that some of legacy of the network that the learning alliance has developed will endure in Lodz. ERCE has secured funds for LIFE + which will budget for communication and dissemination and learning alliance activities.

V. ACKNOWLEDGMENTS

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SWITCH - Sustainable Water management Improves Tomorrow's Cities' Health - (GOCE 018530) is an action research project co-funded by the European Commission and implemented by a consortium of 33 partners from 15 countries (www.switchurbanwater.eu).

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ANNEX

Annex 1: Interviews conducted for Lodz assessments

2010 interviews

Organisation and Name	Role in SWITCH
University of Lodz, Department of Applied Ecology (DAE UŁ) European Regional Centre for Ecohydrology under the auspices of UNESCO, Lodz (ERCE/UNESCO): Prof. Maciej Zalewski,	Chairman of DAE UŁ - co-ordinating unit for SWITCH Lodz Director of ERCE – Lodz; SWITCH partner
(DAE UŁ, ERCE/UNESCO): Dr. Iwona Wagner	City Coordinator, senior scientist Deputy Director of ERCE - Lodz SWITCH partner
(DAE UŁ, ERCE/UNESCO): Monika Dziegielewska-Geitz	Learning alliance facilitator
(UML), Department of Municipal Management, City of Lodz Office: vice Director Ms Jasińska, Anita Waack-Zajac, Barbara Gortat	Implementing partner in SWITCH and learning alliance member
Lodz Infrastructure Company: President Calaestyn Podgórski, Director Marek Skarzewski, Mr Konrad Kulawiak, Renata Borkowska-Kubiak	Learning alliance member
Department of Strategy and Analysis (currently: Bureau of Entrepreneurship, Development and Investor Relations), City of Lodz Office: director Wojciech Michalski, Tomasz Jakubiec	Learning alliance member
University of Lodz MSc Students, PhD Students: Agata Drobniowska, Magdalena Urbaniak, Wojciech Frątczak	Learning alliance members
MOOMOO Architects: Łukasz Pastuszka and	Involved in SWITCH learning

Jakub Majewski	alliance because of interest in urban revitalisation
NGOs: Lodz on Bicycles (Lodz Rowerowa), Group of Certain People (Grupa Pewnych Osób),	Learning alliance members since 2009

2008 interviews

Organisation and Name	Role in SWITCH
Tree Development Company: Wojciech Krasowski and Paweł Bernat	Developers. Learning alliance members
Lodz Infrastructure Company: Teresa Wozniak, president	Learning alliance member
Wastewater Treatment Plant: Mr. Andrzej Czaplą	Learning alliance member
PhD student at Lodz University: Agata Drobniewska	PHD student/ LA member
University of Lodz, Department of Applied Ecology (DAE UŁ) European Regional Centre for Ecohydrology under the auspices of UNESCO, Lodz (ERCE/UNESCO): Prof. Maciej Zalewski,	Chairman of DAE UŁ - co-ordinating unit for SWITCH Lodz Director of ERCE - Lodz SWITCH partner
(DAE UŁ, ERCE/UNESCO): Dr. Iwona Wagner	City Coordinator, senior scientist Deputy Director of ERCE - Lodz SWITCH partner
(DAE UŁ, ERCE/UNESCO): Monika Dziegielewska-Geitz	Learning alliance facilitator

ACRONYMS

BMP	Best management practices
DAE UL	Department of Applied Ecology in the University of Lodz
EHREK	Project for the revitalisation of the Bzura River and Arturowek reservoirs
EKOROB:	Ecotones for Reducing Diffusion Pollution project
ERCE	European Regional Centre for Ecohydrology (under the auspices of UNESCO)

IHE	UNESCO Institute for Water Education
GOS	The Lodz Wastewater Treatment Plant
GPO	Group of Certain People (NGO)
GPPinfoNET	The Green Public Procurement Information Network
IUWM	Integrated urban water management
LSI	Lodz Infrastructure Company
NGO	Non-governmental organisation
POPs	Persistent Organic Pollutants
UL	University of Lodz
UML	City of Lodz Office
UNESCO IHP	UNESCO International Hydrological Programme
WWTP	Wastewater treatment plant
ZDiT	Board for Roads and Transport
ZRODLA	The Centre for Environmental Activities
ZWiK	The Waterworks and Sewage System Company