018530 - SWITCH

Sustainable Water Management in the City of the Future

Integrated Project
Global Change and Ecosystems

D6.2.7 Research needs and opportunities (city storylines 2008)

Period covered: from M13 to M24 Date of preparation: M24

Start date of project: 1 February 2006 Duration: 60 months

Project coordinator name: Carol Howe
Project coordinator organisation name: UNESCO-IHE Revision [final]

SWITCH Deliverable Briefing Note Template

SWITCH Document D6.2.7 Research needs and opportunities Summary of research needs and opportunities for effective research and demonstration activities developed through an integrated planning process known as the city storylines.
Deliverable reference: D6.2.7
Author(s) and Institution(s) Various
Publication date: January 2008
Audience For internal project use.
Purpose To provide a M&E framework for the city learning alliances.
Background Within the confines of what it is possible for the wider SWITCH research team to deliver and to the objectives/deliverables as defined in the proposal and working towards the 'paradigm' shift, city LAs will identify (some WPs have room for 'identification', others only for 'fine-tuning/adjustment') the priorities for research and demonstration activities within each city based upon an assessment of local problems, opportunities and needs. Possible pilot areas/ neighbourhoods will be identified (some demo-sites and demo-activities in a number of cities have already been identified) and at these scales 'neighbourhood' LAs may also be developed (with their own cycles of scoping, stakeholder analysis, LA development, priority setting, implementation and reflection).
Potential Impact n/a
Recommendations n/a

The city report of Tel-Aviv City, Israel
January 2008

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This report provides an overview of the progress made in the SWITCH program in Tel-Aviv in 2007 and sets out the activities for 2008 onwards.

The city and its water and wastewater systems

Tel-Aviv and its metropolitan area has a population of close to 1.5 Million inhabitants. It is the principal city along the Mediterranean coast of Israel and the main commercial center of the country. In Tel Aviv city there are 470000 citizens while during the day more than one million citizens. The city has a consolidated urban area and an expansion zone towards the north. In this area new housing projects of housing are being developed at present for medium to high socio-economic levels.

Drinking water: 90% or 45 MCMY (Million Cubic Meters per Year) is supplied by Mekorot to the city who cares for the quality, another 10% of the supply is by local wells and disinfection of the water by the city. In the 1950's most of the city's supply was from local wells only but due to excessive salinity and industrial pollution only 9 wells out of 80 are active. The quality of the water is monitored by the municipality using outside laboratories. This is besides the analyses by the Ministry of Health.
The sewer system in the city is connected to the regional sewage collection system of the Dan Region Association of towns. The wastewater is collected by pipe-line system and pumping to the Dan Region Association of Towns central pipe-line (Reading-Rishon) to the WWTP (Wastewater Treatment Plant). The effluents are delivered to Mekorot for further tertiary treatment and reuse in the south.

Future Tel-Aviv Water Scheme and Dilemmas
(based on ideas by the alliance members)

In 20-30 years, around Tel-Aviv a high population growth and advanced urbanization is expected. As a result there will be more demand for housing construction, energy demand increase. Also there will be a shift of agricultural land demand from the Tel-Aviv area (where due to population growth there will be changes in land use) to the South of Israel where land is available and if enough

water is supplied there would be more and more sustainable agriculture. Probably more desertization in the southern parts will occur due to climate changes.

In 30 years time the main supply of drinking water will come from more local sources (like desalination, more local wells and may be indirect reuse of effluent) together with much improved (filtered and may be disinfected by other means than chlorine) Mekorot supplied Lake Kinneret water. The effluents that are mainly reused in agriculture will be also reused for municipal and public reuse (street cleaning, fire fighting, park irrigation, recreational) and also for none-food industries (cooling towers..). Due to mixing of the desalinated water this water will contain less salts and less hardness which will enable more industrial reuses. The agricultural water consumption which is around 70% of the total consumption will go down to 50% due to the decrease of the agricultural production and due to more advanced agriculture.
The effluents from the Dan Region that are supplied to the south of Israel will be still required since the agriculture in this part of the country will still be wide-spread although more sophisticated and less water intensive. Still basic agriculture (potatoes, wheat..) will be practiced.
More local effluent reuse for public irrigation and river replenishment can come from small local treatment plants and not only from central plants like the Dan Region WWTP. These plants could use diversified treatments like advanced technologies (MBR..) or natural systems (wet lands..).

Some dilemmas:
1. Today three types of effluents are reused - The restricted irrigation type (secondary, no filtration, some disinfection), the tertiary treated unrestricted irrigation type (deep bed filtered well disinfected) and the Shafdan water (SAT treated almost drinking water type). Will in the future, only one type or two types be used? The SAT treated type as AA quality water for unrestricted agricultural irrigation and human contact public park irrigation or household irrigation and the A type deep bed or membrane filtered and UV or non chlorine disinfected water for all other reuse purposes including unrestricted agricultural irrigation.

The SAT system today is in its full capacity and there is gradual clogging of the infiltration fields.
The surface area needed for infiltration is considerably big and the intensive urbanization does not leave much space for new infiltration areas. So alternatives like improved SAT systems or effluent desalination or what is called "double membrane process (UF-RO)" will be used.

2. Will dual systems be used in the city?
Some experiments are being conducted in other parts of the country and if the risk assessment will show that due to the very good water qualities in these reclaimed pipes even in case of cross-contamination the health risk is low it could be a good alternative. Also in case of very good reclaimed water quality the health risk

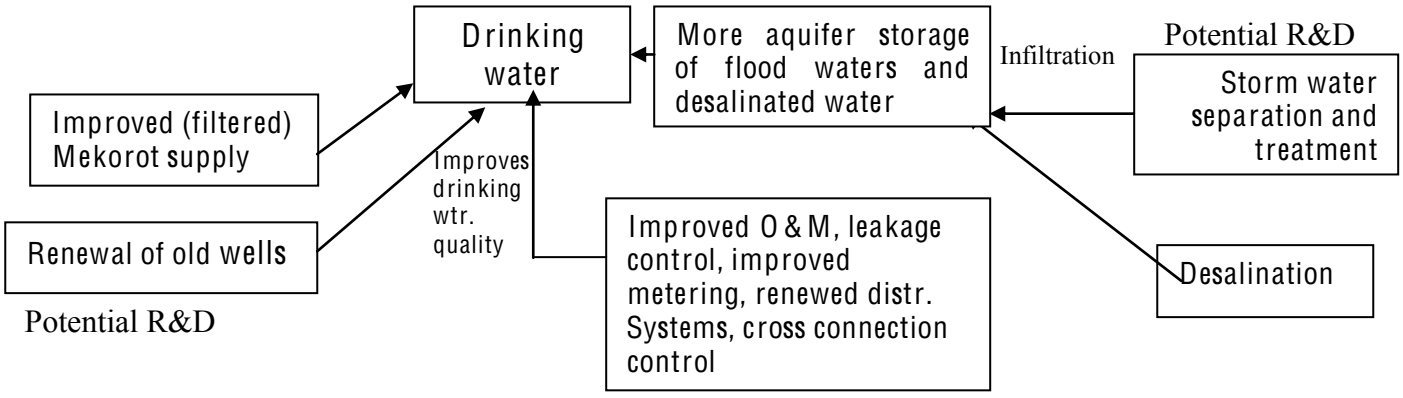
radiuses around drinking water wells will be smaller for the reclaimed water pipe-lines around the wells..

There are plans for artificial islands for the future city of Tel Aviv that will expend the built area and leave more open and green spaces (golf courses). The use of desalinated water that will be located on these islands for drinking, for irrigation and other uses in these cases can be an advantage (since it will be produced and used on spot) instead of bringing reclaim water from a central plant.

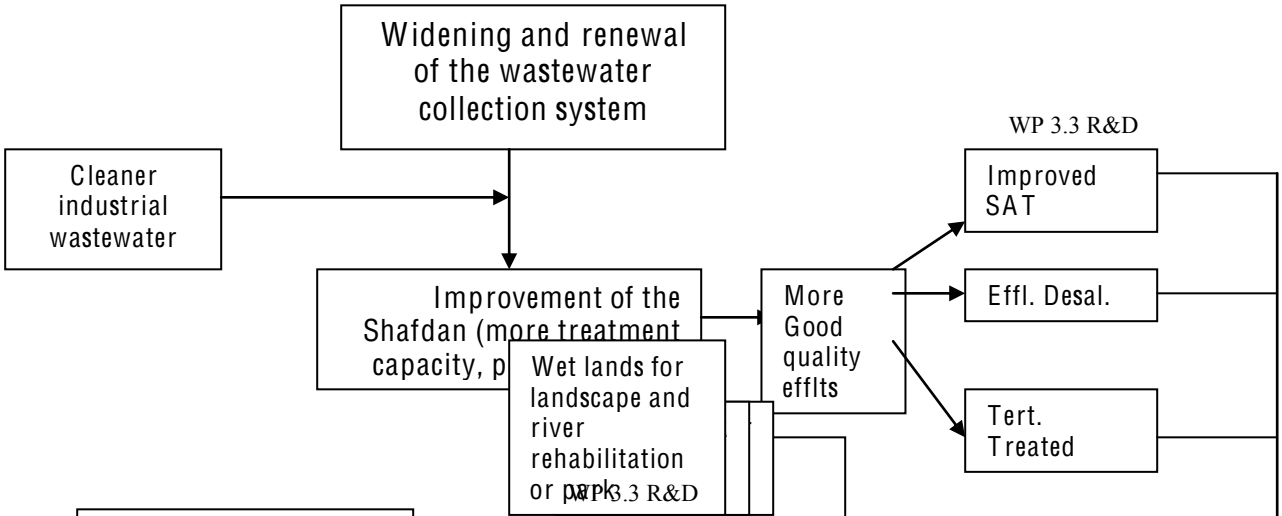
The infrastructures will have to be gradually renewed. The new wastewater collection pipe-lines (the Eastern and Ayalon collectors added to the old Reading – Shafdan collector) will enable to connect more surrounding towns to the main wastewater plant (Shafdan). In the city the infrastructure for drinking water also will have to be renewed gradually and new storage reservoirs be planned.

Flood water will have to be separated from the wastewater sewers (special collecting and infiltration techniques or collection, cleaning and infiltration). More efficient metering methods, leakage control methods to be applied for drinking water and reclaimed water pipe-lines. Improved water security methods to be used. A scenario flow sheet for integrated water management for the future Tel – Aviv city is given below, as well as the potential research topics for SWITCH are mentioned.

Drinking water:



Waste water collection and effluent reuse



SWITCH in the City – Existing relationship to Work packages

Tel-Aviv has been involved in 3 topics of SWITCH mainly:

- WP 1.1 the Development of a Strategic Approach and of Indicators for Sustainability and Risk Assessment and
- WP 3.2 Safe water reuse
- WP 3.3 Other productive reuses

It is realized now that more considerable support must be provided through the IRC under WP 6.2 to encourage the development of a learning alliance to enhance the impact of activities on all or most of SWITCH partners and outside of SWITCH.

Summary of main LA activities of Tel-Aviv (Months 12-23)

A. Dissemination of project information:

A1. Article that introduce the project's vision and strategic to the water professional community in Israel, was published in a professional Israeli water journal "Water Engineering"-April 2007.

A2. Detail report about the second scientific meeting that was held in Tel-Aviv, was published in a professional Israeli water journal "Water Engineering" December 2007.

B. Learning Alliance – "water club" meeting was held on 26.11.07.

Program and issues discussed:

Introduction, meeting plan and objectives (Avi Aharoni – Tel-Aviv coordinator)

The use of sustainability indicators in the planning process in switch cities (Dr. Peter van der Steen)

T.A & Jaffa city indicators development according to the city visions (Anat Amoyal)

Indicators development in Israel (Dr. Erez Svardlov, Matrix)

General discussion, Ideas on a sustainable water system in TA and drafting of December Scenario Planning International Workshop (Dr. Peter Bury)

The absence of the water vision section that should be included in Tel-Aviv city vision was recognized. Program for finalizing the city vision include water aspects was set based on series of meeting with the city strategic planning division and the water club group.

C. A beginning of an internet site for Tel-Aviv was established.

LA facilitator was participated in a workshop held on 25.11.07 in Tel-Aviv. Guidelines about design, set up and maintain of a web site were introduced to the participants. Aspects like why do we need the city web site, who are the potential users and what should be its contents in aim to serve the SWITCH targets were discussed in detail. This important information was further discussed in a meeting of the Israeli SWITCH team and the main purposes and foreseen for the site was defined.

D. Successful second scientific meeting took place in Tel-Aviv in November.

About 70 participants from more then 20 countries and continents as follows: Africa, Europe, Middle East, South America, Far East were attended the scientific meeting.
Change of knowledge, good socialized and start of new cooperation in the SWITCH partners are part of the benefits outcome of the meeting.
Focus and interesting presentation and professional posters that play the role as key elements for further discussions, were introduced. All the committees meeting were very fruitful.
All the aspects of the meeting include scientific content, administrative issues, logistic and social events were performed in a professional way

E. Professional Learning Alliance training workshop on SAT technology was held.
:

Title: Soil/Aquifer-Based Natural Systems for Drinking Water and Wastewater Treatment. Organized by Participants of Work Package 3.2 (Safe Water Reuse): UNESCO-IHE, TU-Berlin, Mekorot Water, and Hebrew University of Jerusalem November 28 and 29, 2007; Metropolitan Hotel, Tel Aviv. Content:
Within the urban water cycle, natural systems can play important roles in both drinking water and wastewater treatment. Broadly, these include more vegetation-based systems such as constructed wetlands and soil/aquifer based systems that rely on soil passage and recovery. Natural systems are attractive because of their low cost and sustainability, and are important barriers within a semi-closed cycle promoting wastewater reclamation/reuse. Topics reviewed and presented:

- Soil Aquifer Treatment (SAT) for Wastewater Treatment and Reclamation/Reuse
- River (and Lake) Bank Filtration (RBF) for Drinking Water Treatment
- SAT and RBF Hybrids Coupled with Other Pretreatment and/or Post-Treatment Processes
- SAT and RBF as Appropriate Technology, and Technology Transfer Considerations

Table 1. Key members of the Learning Alliance and their role at local level

Key organisations (type)	*Mandate, roles & activities*	*Problems and opportunities articulated by this organisation*
Ministry of Interior, Central District Regional Committee for Urban Planning	Responsible for all the issuing of permits for infrastructure (roads, sewer, natural gas, city-trains, intercity trains, public area building like schools and parks..) plans in the T.A. region (1.7 million population) and regional urban planning. The total area that the office is in charge is from Gedera to Hedera (4 million population). Their mandate is the responsibility on all planning performed by the Ministry of Interior. They are the professional body of the Regional	Positive examples of their activities: 1. One of main achievements of the government is the collection of all regional governmental offices under one building in each regional capital (Kiriat Hamemshala) this eases the communication between different governmental offices and decisions are more quickly taken and permits issued. 2. The government created a national committee who deals with objections raised by public organisations or other governmental bodies to

	Committee and they have a strong influence on the decisions of the committee. The director of the Committee is also the chief administrator of the Region for the Ministry of Interior. The Dan Region WWTP and part of the source for the drinking water for the city of Tel –Aviv is under their jurisdiction and control. 40%of the water for T.A. is coming from underground water and the rest is coming from National Water Carrier operated by Mekorot. Almost all the water is produced and treated and supplied to the city by Mekorot (small amounts of wells are maintained by the city itself).. The Dan Region area and the area where the collecting system for the wastewater to the Dan Region are located (250 hectare) under this committee's jurisdiction. They work under the mandate given to them by two laws: The Water Law (1951) – all water sources, and the Wastewater Law (1962). They supervise the different development programs to see if they do not endanger the water sources (safety radiuses). When plans for effluent irrigation plans are presented to them they check if the irrigation is not performed within safe distance from water sources or drinking water pipe-line. This body not only ratify development plans but also takes initiatives.	regional projects. Each project is publicly discussed and objections can be raised within 60 days of the publication. If a project is delayed due to the objections for a long time, this committee tries to mediate and relieve the impasse. Problems: 1. One of the main problems is still the diffusion of the decision power between too many governmental bodies. The best example for this is that the construction of the East wastewater pipe- line carrying wastewater to the Dan Region WWTP took 14 years. In the mean -time due to high flow of wastewater (more p.e. during the years) and lack of effective storm water separation in the winter the "Reading –Rishon pipe line" collapsed. The East wastewater pipe – line: One of the two new collector pipe-lines that collect the east bound cities and the other one (Ayalon pipe-line) collects the north bound cities to Shafdan which is situated in the south of T.A. These are besides the original and oldest collector pipe-line (the Reading –Rishon pipe line) that does not have enough capacity even for the actual wastewater flow. The Ministry of Interior is one of the governmental offices in charge of ratifying the planning of such new projects. 2. The multi-annual planning for all infrastructures is made based on statistical population data from the State Statistics Institute (which is up-dated every 10 -11 years) although the Ministry of Interior has a very accurate on-line record of the population 3. Incineration of Secondary sludge from the Dan region WWTP. The sludge today is being pumped to the deep-see, but its removal will prevent local pollution of the sea and keep a near-by desalination plant from pollution. The building of such a system has been technically adopted but the Green movement is strongly opposed to such a possibility. Recently new risk analysis work has been performed to show that the risk is minimum. This is still being discussed, and development plans are waiting the necessary permits. 4. Plans for treatment of gray water are still not being applied due to different governmental offices objections although the benefit is known and a lot of developed countries have started to apply these plans.
The city of Tel-Aviv (T.A.) Water, wastewater and drainage department	Supply of drinking water to the city. Disposal of wastewater. Responsible for the drainage of storm water together with the Yarkon River drainage authority. The sewer system in the city is connected to the regional sewage collection system of the Dan Region Association of towns.	Problems: Leakage control, replacement of old piping., seasonal (winter) flooding problems. The number of staff for the municipality constantly in decrease.

	Drinking water: 90% or 45 MCMY is supplied by Mekorot to the city who cares for the quality, another 10% of the supply is by local wells and disinfection of the water by the city. In the 1950's most of the city's supply was from local wells only but due to excessive salinity and industrial pollution only 9 wells out of 80 are active. The quality of the water is monitored by the municipality using outside laboratories. This is besides the analyses by the Ministry of Health. The other activities are: Collection of wastewater by pipe-line system and pumping to the Dan Region Association of Towns central pipe-line (Reading-Rishon) to the WWTP. Drainage of rain - water. Monitoring of the consumption of the water and production of wastewater by citizens. Collection of taxes for drinking water consumption and wastewater collection taxes.	
Dan Region Association of Towns	The Dan region Association of Towns is a Non-Profit Organization that actually includes the 7 original municipalities (in the 1950's) and other municipalities that receive the services making on the total 24 municipalities for 2 million p.e. The main service is the collection and transport of wastewater to the Dan Region WWTP, treatment of the wastes and handing the effluents to Mekorot for further tertiary treatment and reuse in the south. In Tel Aviv city there are 470000 citizens while during the day more than one million citizens. The other duties of the Association is also to supervise the sources of wastewater that are conveyed to the WWTP by a special department who visits industrial plants or other sources of wastewater besides the households and prevents pollution at the source. The Association has also established an oil and grease collection and treatment system and a salt separation and sea disposal system. Both help improve the quality of the wastewater that is conveyed to the WWTP. They also treat the sludge from the WWTP. All the big projects are planned and performed by outside sourcing. The routine maintenance is in-house.	Positive examples of their activities: 1. Starting from the 1970's the Associations' department for the control of industrial pollution sources has succeeded to considerably decrease the pollution of wastewater from industrial sources (which is almost 10% of the total wastewater flow). The oil separation and treatment program, the salt separation program and successful monitoring of heavy metal sources have been effective. Future development plans: 1. The East wastewater collection pipe-line which is finally under construction will connect another 500000 p.e. to the Dan Region WWTP. 2. The North wastewater collection pipe-line "Ayalon" is being planned and finance sources are sought. 3. Development of the Dan Region WWTP will be accordingly, but it has enough capacity for both new collector pipe-lines wastewater. 4. Operation of a primary treatment unit in the WWTP (till 2030). 5. Operation of the sludge treatment system. From 2010 no sludge from the WWTP will be disposed to the sea. These days the sludge filtration stage is starting to be constructed. As a second stage, the opted process is incineration instead of composting (will leave excess compost). But the whole project has still opposition by the Green movement. 6. Combined sewer and flood water systems. Where the storm water will be separated and sent to the river after proper filtration. 7. Improvement of individual homes rain water separation systems. Financial support is given. Low quality effluent storage reservoir

		construction. Today, in case of a malfunction in the WWTP the effluents are not sent to the SAT but to the river and then to the sea. The 500,000 m^3 reservoir will enable these effluents to be further treated.
Moshavei Ha Negev (Negev Region farmers association), end users of the reclaimed water, private company	The biggest agricultural company in Israel. They culture 15000 hectares of land and use 24 MCMY of water of different qualities (effluents, drinking water, salty water, desalinated water..). The main crop is wheat (7000 hectare crop, 600 hectare for seeds), also pees, 1000 hectare, 1000 hectare water-melon, 1000 hectare potatoes (they grow three times more since they have reclaimed water) and different other crops. Mekorot through the Dan Region Project (SAT treated water – the Third Line) supplies 13 MCMY. 7-8 MCMY comes from the secondary effluents of the Beer-Sheba WWTP, 2-3 MCMY are from fresh water supplied by Mekorot and another 1 MCMY are from self sources. The new desalinated water from the Ashkelon plant will replace the fresh water. The secondary effluents from the Beersheba WWTP are planned to be up-graded to tertiary quality by filtration and disinfection (around 11 MCMY) of tertiary effluents (conforming the Inbar Committee specification) will be supplied to different parts in the area.	They are satisfied with the Dan Region Project that gave life to the agriculture in this arid part of Israel (the irrigated areas where multiplied since the beginning of the Dan Region Project in 1989). Their relationship with Mekorot is good. No problems with the supply. They would like to get more reclaimed water (lately a 9% decrease was imposed to them by the Water Commissioner). Quality of the water - Some encountered problems in supply are due to the clogging of their pre-filters before irrigation by sand, algae (from the open reclaimed water reservoirs) and also the manganese that comes from the Third Line. The sand is filtered and there is filtration and chlorination to get rid of the algae. The problem of manganese originates from some wells in the Dan Project and then the soluble manganese in contact with air forms solid manganese dioxide and clogs their filters. Mekorot is closing the wells that contain high amounts of manganese and also applying other measures. The situation is much better lately. One of other objection is the high price of reclaimed Third line water (costs to them around 70% of the fresh water cost and they are not allowed to use more fresh water). The fresh water cost for them is 1.26 NSH/m^3 (5.6 NSH= 1 EU) while the Third Line water costs 0.84 NSH/m^3 and secondary effluents cost 0.57 NSH/m^3. The cost of up-grading the effluents to the new Inbar committee tertiary effluents quality will be 0.15 SH/m^3. The association will need more water in the future and that will come mainly from Desalination and up-graded secondary effluents (Beersheba WWTP and others) with some more addition from the Third line.
Ministry of National Infra-structures, Water Commision	The main regulatory body in Israel for the water supply and demand. Responsible for all water resources in the country. Each year they issue permits to produce water from different sources including desalination and reclaimed water and also issues quotas for the end-users that restrict the use of a specific type of water to the allocated quota. Their mandate is covered by the "Water Law". They supervise on "water quota" use by the help of the Hydrological Service and by proper monitoring. Demand management includes the farmers, the industries and even individual users. For the farmers the demand comes through the Ministry of Agriculture and the quotas are decided in common. After the 2000 drought, there was a constant decrease in the quotas for the agriculture (30% decrease compared to the	They have a major problem of lack of experienced staff and trained engineers. They are obliged to use out-sourcing and they would be very happy if there was more interest in Water Sciences and Engineering. Due to the relatively low salaries students prefer to choose high tech. and less environmental studies. Most of the future master plans for Water and wastewater are prepared by their engineers. The Commission is the major governmental body who pushed the decision to unit all concerned water related government offices under the State Water Authority (beginning 2007). The idea is to have a central body that will decide on all water and wastewater matters and this will prevent the non-efficiency of having a lot of offices having jurisdiction on the same water source. This body will include all concerned governmental offices and regional bodies and will be leaded by the actual Water Commissioner. Main future plans: The "2002-2010 plan" that has the

	situation in 1989). But the agriculture was not damaged. There is a Governmental decision to keep the agriculture and to let the farmers use 1160 MCMY of different water sources (fresh water only 530 MCMY). Out of it 30 MCMY will go to the Negev (see also above – today they use 24 MCMY). Other activities include prevention of water sources by monitoring, involvement in the desalination plans, monitoring of the hydrological changes in the region and also responsibility for the long-range Master planning of the water demand and supply in Israel. They use a lot of outside engineering help due to staff penury. All national water programs and Master plans have to be approved by the Commission and this is done by cooperation with concerned ministries. Also they are involved in "Water Governance" although it is not part of their original mandate. They mediate between different stakeholders (suppliers or users) to contribute to the successful management of water sources of a given region. The cooperation at the municipal level is good. Each municipality through their engineering department prepares their Master plans and they are assisted by the Commissions' engineers. Also in the technical discussions with other government offices on these plans they have a major influence. The Commission can influence on the decision to allocate grants to the municipalities by the Water Authority of the specific region.	purpose to ease the situation created in early 2000 by adding 315 MCMY of desalinated water to the water balance and also add more reused effluents (up to 500 MCMY in 2010). The main desalination plants that will be operative till 2010 are: Ashkelon (100 MCMY), Palmahim (30 MCMY), Hedera (100 MCMY), Shomrat (30 MCMY) and Ashdod (45 MCMY). The state gives 60% grants the rest is private. There is a problem in part of these projects. For example in Ashdod Mekorot is ready to start the project (and even created, as required, a separate company Yizum that will be in charge of the development plans) but still the Finance Ministry is not releasing the necessary funds (the foot-print of the Ashdod plant is small and this will make the water production more expensive..). Long range strategic planning to 2040 will deal with 10 different water related subjects. The Master plans for that are prepared by the Commission in-house.
IWA – Israeli Water Association	The Israeli Water Association is an NGO with members from all sectors of water and wastewater. The association has members from different affiliations such as design, management, operation, industries, economy, law, education and government authorities. The management of the Association consists of a multi disciplinary team of high-level professionals in the areas of water and wastewater, who have volunteered their time and expertise to advance water issues in Israel and world wide. One of our prime goals is to increase know-how and awareness of the public as well as the professional community and policy makers on water and wastewater issues. Additional goals are training and updating, updated the members about novel technologies, legislation and relationships with international professional organizations.	Water is a scarce commodity in Israel and must be managed with great care including minimizing water loss, use of marginal waters with advanced treatment technologies, maximizing wastewater effluent reuse and minimizing potential contamination of existing water resources. Professional expertise is required to ensure proper management. IWA's unique position as Israel's leader in providing conferences, courses and seminars on water and wastewater issues for the professional water sector grants a golden opportunity and platform for disseminating the outcome of the various work packages.
Ministry of Health, environmental	Role: The Ministry of Health is divided in to 7	Problems: Safety radiuses for drinking water well

Health Dept., Central District and Tel-Aviv Region	districts throughout Israel and all report to the main office. They also have 4 regional labs. And one central lab. (Tel-Aviv). Each district has a district office under the management of the District Physician (doctor). The Ministry of health has in each District Office the following departments: Food, pharmaceutical, teeth heath, geriatric, psychiatric, epidemiologic, environmental health.. All offices are part of the public health services. In parallel there are the medical services which include the management of all hospitals in Israel. At the top there is the general manager and the responsible minister. The environmental health department is based on a chief engineer and 7 engineers as heads of the different districts. The mandate: Their mandate is covered by the following laws and regulation: Public Health Order, Water Law, the law that requires a permit for businesses in the city, Safety Radius (meaning what is the safe radius for drinking water pipe-lines that no other water or chemical intrusion to the soil occurs and no other pipe-lines are present), Local Government Law, Sewer Law, Drinking water regulations, Swimming pools regulations, Effluent regulations (BOD 20/TSS 30) and Inbar Committee regulations, permit for irrigation with effluents, Back-flow prevention regulations. They also are the consulting body for all sewage related matters and also for the Regional Committee for Urban Planning. Activities: Control of the drinking water quality and the water sources. Permits for drilling of wells (if they will be used for drinking purposes) through them. They have to ensure that contaminated wells are not used for drinking water. Although drilling permits are issued by The Water Commission. They perform environmental studies that show the Safety Radius areas and the quality of the water to be reclaimed. They perform bacteriological, chemical and hydrological monitoring of the drinking water. Analyses performed between once a week (bacteriology), to once in 6 years (complete analysis, while for surface water the maximum is every 3 years complete analysis). Ministerial responsibility on all Mekorot's water treatment plants. Monitoring of the surface water turbidity (average 1 NTU and up to 3 NTU), monitoring of the drinking water quality (up to 1 NTU turbidity and 50 (max. 70 mg/l) NO_3. The drinking water regulations are being lately revised (Adin Committee) and will be	drilling. Lack of suitable financial resources of the local government makes it harder to keep a good drinking water quality and pollution out of the drinking water wells. Old water and wastewater distribution system is taking too long and is not methodically done. The Tel-Aviv municipality wastewater distribution system is 30-40 years old and the pipe-line renewal rate is low. The maintenance level of the distribution system is not very high. All that can cause biofilm growth and microbial pollution in the distribution system and cause a higher chlorine demand. Also frequent leakages of wastewater distribution system in the drinking water aquifer areas can cause severe pollution. New master plan takes in to account the priority of drinking water aquifer areas for the distribution systems renewal. The Ministry of Health, Environmental Health department is responsible for a lot of functions but is a weak governmental body. Most of their decision making power has been transferred to the Water Commission.

	published soon. Other activities include issue of permits for water and wastewater systems in new building projects. The Central District of the Ministry of Health is responsible for all water sources for Tel Aviv and its surroundings. 10% of the water supply to Tel -Aviv is from self sources and the production and water supply to the city is monitored by the Ministry of Health. Bacteriological and chemical monitoring of the cities supplied water is their responsibility. Sampling is performed by the municipality and the Ministry of Health. The analysis is done in the Ministry of Health's labs. Monitoring of 18 water reservoirs in the city (cleaning and disinfection of the water in the reservoirs – once a year for ground water and twice a year for surface water). They are in charge of water treatment systems in the city (micro-organics removal, solvent removal – dichloroethylene as example). Stopping the pumping in certain polluted wells is their responsibility. Prevention of flow of pesticides tank wash water and fertilizer tanks washing to the water systems is their responsibility (Public Health Order, fertilizer dilution regulations, 1986). Also monitoring of effluent reuse regulations in the city for public gardening (1992) is their responsibility (0 Faecal Coli requirement). Other projects that they monitor are: Desalination system of the TA municipality, the quality in the flood water collection system of the municipality, monitoring of the WWTP effluent quality, SAT water quality, sludge incineration study (first time in Israel in the Dan Region)..	

Planned activities of Tel-Aviv LA (Months 24 -42)

- Water Club meeting of Hebrew speakers with TLV Strategic Planning division to discuss the introduction of Water Vision into the TA City Vision. Reporting.
- Workshop of the Water Club with LA and IRC experts to build up a shared vision of the City and the WC. Reporting.
- Develop strategy to achieve the vision goals. Reporting.
- Select indicators to enable monitoring the advancement towards meeting the goals (some indicators from existing ones that have been developed by the Israeli water Authority Strategic group will be used) Reporting.
- Identify WPs that could contribute to the fulfillment of the city vision by approaching the various WP leaders. Call for participation.

Requested additional budget for activities in WP 6.2 (Months 24-42)

To implement the envisaged activities under 6.2 additional funding is needed. This overview does not include the support from the IRC team.

Table 2 Additional budget for activities in WP 6.2 (Months 24-42)

Items	EUROS
City facilitator including web management	30,000
Travel (2 trips)	7,500
Water Club Meetings	7,500
Unforeseen	1,500
Overhead 20%	9,500
TOTAL	55,800

Alexandria, Egypt

City Coordinator	LA Facilitator	Champion
Dr. Khaled Abuzeid Regional Water Resources Programme Manager CEDARE	Ahmed Essam and Lama El Hatow Programme Assistants, Water Resources Programme, CEDARE	

The city and its water resources

Alexandria City in the northern coast of Egypt is the most downstream city on the longest river in the world, the Nile River, with Egypt being the most downstream country on the Nile that is shared among 10 countries. Similar to the whole country of Egypt, the Nile River represents the main renewable source of water supplying over 95% of its water demand. Currently the City of Alexandria receives its urban water from the Nile. Currently inhabited by more than 4 million people, the city of Alexandria resides on the Mediterranean coast, which makes it a summer destination, increasing its population in the summer to 6 million people putting more pressure on the city's water demand. Although the city receives rainfall of about 200 mm/year, this storm water find its way into sewage systems, drains into the Mediterranean Sea without use, or seeps into the coastal groundwater aquifer through the little-left infiltration areas of the city. Most of the city is covered with potable water supply networks, but many peri-urban and informal settlements lack sewage/sanitation coverage. Most of the city sewage is at least primary or secondary treated, however potential uses of this treated wastewater are yet to be explored in line with the country's National Water Resources Plan.

Main water pressures and issues affecting Alexandria

Satisfying the increasing water demand, developing local water resources, collecting and separating storm water and making use of it, along with groundwater use, grey water recycling, reuse of treated wastewater, water demand management, allocating the appropriate water resources to the appropriate water uses, exploring other non-conventional water resources such as sea water or brackish groundwater desalination, and protecting water ways, and water bodies such as lake Maryout from pollution are some of the challenging water management issues that puts pressure on the city of Alexandria.

In the city of Alexandria there are 9 low-income, peri-urban areas that remain un- or under-served with water and sanitation services. Though there are city and governorate level plans for extending or up-grading services to these areas, the involvement of residents / users from these marginalized areas of the city has been limited.

A number of efforts are being exerted by the Egyptian Government to address the problems in Alexandria, such as:

1. The efforts of the Ministry of Housing in cooperation with Alexandria Company for Sanitation, to enhance the treatment and reuse of sanitary waste-water that is currently being dumped into water bodies.

2. The Governorate of Alexandria is exerting serious efforts towards the development plan of Alexandria and towards achieving efficient decision-making. Its true willingness to engage in wider dialogues with stakeholders is encouraging and reflecting the desire to achieve sustainable and popular accomplishments. A coordinating donors' activities' unit has been set up within the governorate.

3. The Governorate is also implementing the 'Informal Settlements Development Program', which reflects the serious confrontation of the ever-growing slums' expansion, represented by 30 informal settlements in Alexandria, which are inhabited by about 1.36 million inhabitants, as follows:
   - 9 in Al Montazah district (formal and informal);
   - 8 in Amiriya district (mostly informal);
   - 5 in East district (formal and informal),
   - 2 in Central district (formal and informal),
   - 5 in West district (mostly informal), and
   - 1 in Borg Al Arab Markaz and City

Alexandria enjoys a vibrant civil society represented by strong NGOs as well as an active elected public local council. Cooperation between these entities is strong and continued, which is considered an added strength to proper development. Furthermore, there is a noticeable and welcomed international donors' interest in Alexandria's development.

Alexandria LA establishment and Stakeholder engagement strategy

The learning alliance has already been established with representatives from all the sectors in Alexandria. These include representatives from Ministry of Housing, Alexandria Drinking Water Holding Company, Alexandria Sanitation Services Holding Company, Academic Research Institutes and universities, local NGOs, Alexandria Governorate, Environmental Agency of the Alexandria governorate, City coordinator, members of CEDARE, and representatives from the Ministry of Water Resources and Irrigation, Minstry of Health,. The ToR's for these representatives includes highlighting the challenges faced in Alexandria with respect to water-related issues, as well as ensuring dissemination of information between the different LA and stakeholders of all sectors in Alexandria. It is important to focus on IUWM and coordinate between parties to gather information from all sectors in Alexandria on resources, infrastructure, stakeholders, and demands of the people. Once this information is gathered, it is important for them to put guidelines for an IUWM plan to be developed and implemented in Alexandria. Rules and procedures that govern the functioning of the LA group are in effect, but need more time and effort to reach such clear agreements on the

commitments to be made by the SWITCH project and the participants. In terms of facilitation of the learning alliance, an LA facilitator and co-facilitator have been appointed for the city of Alexandria, as well as several other members of the CEDARE team who help in the LA facilitation.

Involvement in LA includes:

1. Ministry of Water Resources and Irrigation,
2. Ministry of Housing, Utilities & Urban Development,
3. Ministry of Agriculture and Land Reclamation,
4. Ministry of Health and Population,
5. Ministry of State for Environment Affairs,
6. Alexandria Governorate,
7. The Holding Company for Water and Sanitation Services,
8. Holding Company for Drinking Water in Alexandria,
9. Holding Company for Sanitation Services in Alexandria,
10. Professors in Universities and Research Centers,
11. NGOs.

The above mentioned directorates nominated one or two participants to be members in the LA Working Group, and to take the following tasks:

1. To coordinate between the represented directorate and the LA
2. To facilitate any requirements or data from the directorate needed for the project
3. To represent the directorate in the upcoming events (training, workshops, ect.)

The LA meetings are planned regularly every three months in the Alexandria Governorate. There is one that is take place on January 23rd, 2008 in Alexandria.

Overall LA objectives

An effective partnership for knowledge sharing in urban water management in Alexandria and Egypt. To support the development of the IUWM plan and demonstration activities, a learning alliance involving key city (but also national and neighborhood level) stakeholders would provide a platform to identify detailed research needs, undertake joint research activities and share results. It would also collate and make accessible existing knowledge and best practice, document case studies and accessible policy briefs targeted at decision makers (English and Arabic language), develop a city urban water management website and newsletter, and hold regular conferences, workshops and other events. The learning alliance would facilitate two key activities that have been provisionally identified:

a. IUWM planning
b. piloting development-scale IUWM approaches (demonstration site)

Communication between LA members is always there, especially by phone, emails, and official letters. There are occasional visits to Alexandria (meetings, training,

workshops, etc.), as well as the regular LA meetings that take place every 3 months. Due to their interrelated nature of work, such mechanisms allow continuous communication but there is always room for improvement of communication. For this reason, establishing an Alexandria City website is an optimum mechanism of disseminating information regarding the SWITCH project. The city website development was established soon to facilitate information among the various LA members and it is updated regularly with the recent events, final reports, news for the upcoming meetings and trainings and important links to most of Alexandria Stakholders..

The address for this website is http://switchalex.wordpress.com. A city poster was produced to document the Alexandria vision, scenarios, LA members, Challenges, needed research studies, objectives of the Alexandria LA and its progress thus far.

Monitoring and tracking mechanisms are in place, and used to measure how to approach the objectives. Whenever an activity is carried out, feedback is collected using a simple evaluation form, disseminated to the participants and returned for feedback on what was done and whether we are on the right track to achieve our goals. The Alexandria LA co-facilitator participated in the LA training workshop in Accra, Ghana on December 11-14, 2007, to enhance the mechanisms with respect to LA facilitation. The training focused on monitoring and evaluation to develop monitoring plans.

Process documentation techniques were used from the beginning, utilizing the different documentation mechanisms like writing articles and essays, tacking photos, and video recording of events to document the activities being done, however some of these mechanisms require more efforts in order to become more organized and representative. This was enhanced by members of the CEDARE team participated in the process documentation training in Lodz, Poland in 2007. Mostly changes have been documented by either writing reports or through photography since these two are quite feasible. Video recording documentation needs further practice in order to perfect its use as a documentation tool.

Three LA meetings took place in Alexandria from M13-24. 14th March 2007, 12th June 2007, and 23rd of January 2008. The meetings were intended to introduce the Alexandria LA to each other and begin assessing the situation of water supply and sewage facility in the city. These four meetings were very successful, and it was recommended to invite members from the private sector and other agencies to join the Learning Alliances. In the 3rd meeting on June 12th 2007, a panel was agreed upon in order to select a demonstration site in Alexandria according to the criteria. The meeting introduced new LA members, discussed what is expected from the SWITCH project in Alexandria, how can each member play a very important role in the process of assessing the situation of water resources and sanitation services and facilities in the city, and it resulted in some assignments for each member to get ready for the next workshop on "Visioning and Scenario building for Alexandria IUWM plan" in July 2007.

Learning Alliance members goals and aspirations

Stakeholders are categorized in two main groups; primary and secondary. Primary stakeholders are the intended beneficiaries of the project, while secondary stakeholders are those who act as intermediaries. The two levels would assist in conducting the analysis pertaining to the management of water resources in Alexandria, and the analysis pertaining to the stakeholders' involvement in the SWITCH Project.

LA member	Issues, goals and aspirations
Ministry of Water Resources & Irrigation (MWRI), Egyptian Water Partnership (EWP), Universities, Research Institutes	**Supply optimization**, including assessments of surface and groundwater supplies, water balances, wastewater reuse, and environmental impacts of distribution and use options.
EWP, MWRI	**Demand management**, including cost-recovery policies, water use efficiency technologies, and decentralized water management authority.
Peri-Urban Communities, NGOs	**Equitable access** to water resources through participatory and transparent management, including support for effective water users association, involvement of marginalized groups, and consideration of gender issues.
EWP, MWRI, Ministry of Environment (MOE), Alexandria Sanitation Company (ASC), Governorate of Alexandria (GOA)	**Improved policy, regulatory and institutional frameworks**, such as the implementation of the polluter-pays principle, water quality norms and standards, and market-based regulatory mechanisms.
MWRI, GOA, EWP, ASC, Universities, Research Institutes	**Intersectoral approach** to decision-making, combining authority with responsibility for managing the water resource

Primary Stakeholders

- Alexandria Governorate (Governor, or assigned representative)
- Ministry of Water Resources and Irrigation (MWRI)
- Ministry of Housing, Utilities, and Urban Communities
- Drinking Water and Sanitation Holding Company for Egypt (under Ministry of Housing) (National Organization for Potable Water & Sanitary Drainage)
- Alexandria Holding Company for Drinking Water
- Alexandria Holding Company for Sanitary Drainage
- Ministry of Agriculture
- Egyptian Environmental Affairs Agency (EEAA)
- Ministry of Health
- Alexandria Local Council

Secondary Stakeholders & Special Interest Groups

- Center for Environment and Development in the Arab Region and Europe (CEDARE)
- NGO's (leading: Egyptian Water Partnership, Friends of the Environment, and Pioneers of the Environment)
- Research Community in Alexandria (University of Alexandria, National Institute for Ocean Sciences)
- Fisherman Authority
- Political parties (NDP representatives of Alexandria)
- Local community
- Lobby groups (Media and others)

The main interests for the different primary and secondary stakeholders were clarified in the stakeholder analysis report. The Stakeholder Analysis report for the city of Alexandria has been submitted however, it may require some modification. These modifications are being made and the report will be re-submitted soon. The stakeholders for Alexandria encompass participants from all sectors of society including the Ministries of Water Resources and Irrigation, Housing, Environment, Health, and Agriculture. It also encompasses members of the Governorate of Alexandria, the National Water and Wastewater Holding Company, Alexandria Drinking Water Company, Alexandria Wastewater Company, experts and professors from Alexandria University, local NGOs, political parties, and civil society participants. Each of these stakeholders have been assessed with respect to their resources (human, financial, etc.), influence, and involvement in the decision making process. These have all been analyzed and assessed within the Stakeholder Analysis report for the city of Alexandria.

Towards an IUWM Plan

This activity would support the Governorate and other key institutions to develop a plan for integrated urban water management up till 2017, and possibly a vision fo IUWM up till 2037, identifying scenarios, strategies and plans for more sustainable, less risk-prone and more equitable water management that supports city development. The plan would be consistent with the National Water Resources Management Plan (which envisions the development of local plans) and existing sector plans in Alexandria (water and sanitation master plans are currently being developed to 2037). However there is currently no integrated planning or innovative urban water management measures is taking place at the city scale. Implementation would depend on alignment and adding value (without duplicating existing plans and planning processes). SWITCH's role would be to provide an integrated planning methodology, framework/ principles, mentoring/ facilitation/ backstopping support etc. Potentially the planning methodology could be scaled up to other cities in Egypt.

The "Alexandria Integrated Urban Water Management (IUWM) Plan for year 2030) / A Vision for the Water Future of Alexandria" is envisaged to include futuristic thinking of the water supply and sanitation sector in Alexandria. It will look at how Alexandria can meet a large part of its future water demand locally

without depending mainly on Nile Waters as it will be difficult in the future to meet the growing demands with increasing demand in the upstream part of the Nile in Egypt. It will look at making use of rainfall harvesting and storm water usage in Alexandria which receives little rain but can help in filling the demand gap, at using groundwater while managing potential problems of salt water intrusion, with Alexandria being a coastal city, at water demand management measures that could be considered to reduce water requirements. It doesn't leave out the wastewater treatment and reuse options, the enforcement of regulations to prevent industrial pollution of water bodies.

SWITCH has been introduced to the city of Alexandria to set the stage for Alexandria to be among the leading cities in implementing Integrated Urban Water Management (IUWM). An IUWM long term plan will be developed. The IUWM plan will address current problems and issues of urban water management in Alexandria including lack of sanitation coverage, industrial pollution and challenges facing the supply of water to a city that is located at the end of the Nile River system, which is considered the main renewable water resource of Egypt that supplies more than 95% of its demand. The overall objective of SWITCH-LA in Alexandria is to provide a framework and tools and main guidelines for assist the city of Alexandria to produce and to implement an Integrated Urban Water Management (IUWM) plan. This plan will address the previous mentioned pressures in Alexandria and possible alternatives for solutions. It will try to build on the innovations developed in the SWITCH research activities and other demo cities, as well as those urban water management measures that will prove applicable for Alexandria.

This should all be done in parallel with investigating and utilizing other water resources that are available and feasible to use such as rainwater, groundwater, desalination, as well as reuse and recycled water resources. The aim is to not become solely dependant on the River Nile water, and integrate one or more of these resources where feasible into the Alexandria water network. This is all necessary for the "Integrated Urban Water Management plan" for the city of Alexandria which will be the main output result for the SWITCH project in Alexandria to face and overcome the rapid increase in water demand of the city by the year 2037.

Linkages of SWITCH with other regional/city water initiatives

The SWITCH Project has established links with several activities and initiatives in Alexandria including:

- National Water Resources Plan-NWRP (Egypt's IWRM Plan 2017)
- National Water MDGs Plan (2015)
- WSS Master Plans (2037)
- Lake Maryut Project
- "Alexandria Growth Pole" World Bank Project
- Governorate Advisory Committee on Storm Water Management

Alexandria IUWM Vision

The workshop on "Visioning and Scenario building for Alexandria IUWM plan" took place on 24-25 of July 2007 at Helnan Palestine hotel in Alexandria. This workshop was preceded by a short preparation session on the 23rd and was followed by an evaluation session on the 25th. The workshop was very successful in coming up with the initial statement of Alexandria's SWITCH project Vision, Objectives, Strategies, and different predicted scenarios. The exercises and workshop were extremely beneficial for all LA members present. The outputs agreed upon from this workshop include a vision statement and several initiatives aimed for year 2037. Alexandria's LA team now has an agreed-on vision which can be described as:

- We envision a proud water city where available water resources are managed in an integrated manner, with the participation of all citizens, and are used effectively for development within a framework of environmental sustainability
- Where all citizens have access to high quality (meeting national norms), reliable, sustainable, and affordable water and sanitation services and benefit from a clean and healthy environment
    A. A clean and well managed aquatic environment (coastal and lake Maryut?)
    B. Provided by a renewed and upgraded network
    C. With full separation of sanitation and (agricultural and rainwater) drainage networks
    D. With treatment and reuse of agricultural, industrial, and domestic wastewater
    E. With agricultural water use managed as part of a city wide water management plan

SWITCH Demonstration activities

Development of Sustainable Neighborhood-scale IUWM in Fishing Village

A proposal was prepared to be submitted in month 24, The purpose of the demo project is to move towards a closed loop systems that minimizes water use, wastewater reuse, improves aesthetics and public health, include institutional and governance systems, and are feasibly operational, and financially viable. The project will involve piloting of the most appropriate technologies and strategies for water sensitive design including decentralized wastewater treatment, water demand management, rainwater harvesting and water reuse. SWITCH's support to this demonstration site is imperative to promote more sustainable service delivery and improved urban development in this sensitive environment to reduce the burden of new development on water resources, utilities and environment. In this area, SWITCH will focus facilitating planning of upgraded basic infrastructure (water, sewerage and drainage), and possibly solid waste management to protect open water bodies such as Lake Maryout from pollution.

A site selection panel of LA members was chosen to visit several sites to select an appropriate demonstration site according to the criteria imposed. A decision was made to select the fishing village (Maa'wa Elsayadien) as Alexandria's demonstration site. Information pertaining to this specific area, including water and sanitation services, was collected but needs more details, verification, and fine-tuning. Stakeholder mapping within the fishing village is in progress as it is a component of the social inclusion survey that is currently in progress there. Options including a questionnaire survey would enable us to determine the qualified individuals within that community, and their further involvement with the project. This questionnaire will be completed in order to map the stakeholders and representatives of the community, as well as assess their needs as a society. It is important to select individuals who are qualified and well educated to be able to better represent the local community in the LA. The survey questionnaire is in progress, and it will help us to determine the key stakeholders within this community.

This fishing village is a slum area that is currently without adequate official and community developed sanitary system. Characteristics of the fishing village include:

- It's area is about 65 feddan ~ 273,000 m^2
- The eastern boundary is: the highway entrance
- The western boundary is: lake Maryut
- The northern boundary is: Tarek St.
- The southern boundary is: Elkabbary road
- Number of residents: 10,564

Sanitation services: There is a random sanitation service done with the public's efforts. The main roads contain sanitation pipe networks however the smaller more narrow roads do not, due to the nature of their narrowness and the slope elevation of these inner roads. Unconventional sanitation systems need to be explored here. The existing sanitation network is connected to the Gharbeia Wastewater treatment Plant.

Water services: There is an already existing water supply network to the majority of the village with 95% water coverage. However there are some areas that are still uncovered. There are 1272 households that receive water. Water quality and availability appear to not be a problem, however changing the behavior of dealing with water as an important resource would be beneficial. Pipes of sizes 4 inch and 6 inch diameters need maintenance in network. Maintenance needs to be done to prevent losses in the network due to connection problems and to detect water theft in the system.

Buildings & population: The majority of the households are small buildings of 1 to 2 floors, but the area is of controllable size, and of reasonable population. The fishing village has been an area for 2 or 3 previous service projects done by foreign agencies, and non-governmental organizations.

Innovative features/science:
Unconventional urban sanitation systems will be implemented and utilized in the fishing village due to its complex nature. A feasibility study will be performed on the area to see what alternative urban sanitation system is the most appropriate, and how best to implement it in this area.

Potential impact:

1. Reducing the disposal of sewage and pollution into Lake Maryout
2. Improving sanitation services by construction of new alternative technologies of wastewater collection
3. Treatment of wastewater in nearby wastewater treatment plant
4. Increase water availability for agriculture by reuse of treated wastewater
5. Improving livelihood of people in the village

Relationship to LA – evidence of demand:
Members of the LA have in fact been the ones that researched possible locations of demonstration sites in Alexandria based on the area's demand and its fitting with the criteria imposed. Specific criteria for the demonstration site, was imposed on the selection committee comprised of LA members. LA members have been involved in the decision making process for the demo site and their response was very positive.

Plans/ideas for scaling up:
This demonstration site will act as a pilot project for future projects in other sites around Alexandria and Egypt. A policy briefing paper with the outcomes of the demonstration project, along with its strengths and weaknesses will be compiled at the end of the project to be used for future areas in Egypt.

Co-funding confirmation:
The Alexandria Governorate and the Alexandria wastewater company have indicated willingness to share in the costs and especially to cover the installation of sewage networks and connections to households and to transport the sewage to the closest treatment facility.

Alexandria Demonstration Project Budget Request

Year	Partner	Budget (EUR)	Matching Fund Organization (name)	Budget (EUR)	Total Budget (EUR)
2006	-	-	-	-	-
2007	-	-	-	-	-
2008	CEDARE, IRC, UNESCO-IHE	**39,710**	Water Company Alexandria, Wastewater Company Alexandria, Alexandria Governorate	73,748	113,459
2009	CEDARE, IRC, UNESCO-IHE	**79,421**	Water Company Alexandria, Wastewater Company Alexandria, Alexandria Governorate	147,496	226,917
2010 – Feb. 2011	CEDARE, IRC, UNESCO-IHE	**92,658**	Water Company Alexandria, Wastewater Company Alexandria, Alexandria Governorate	172,079	264,737
Total	CEDARE, IRC, UNESCO-IHE	**211,789**	Water Company Alexandria, Wastewater Company Alexandria, Alexandria Governorate	393,323	605,112

SWITH relation to workpackages

Workpackage 1.1-1.4 (See also D6.2.14)

CEDARE will work with Learning Alliance to define vision, sustainability indicators and scenarios for future urban water management in Alexandria. This will include analysis of existing plans and agree on the concept, scope of work, and roles/responsibilities for an IUWM plan at city level, an agreed for an IUWM plan and IUWM plans being put on national policy agenda. Life cycle assessment will build on a conceptual model of the city to quantify overall environmental impact of the urban water system. At the end of Month 30 the Decision Support System will be clear and agreed with data and software requirements.

There will be 3 more workshops till month 60 for the process of IUWM planning. It is noteworthy here to mention that activities under theme 1 here also collide with some new activities under WP 6.2. The additional funding requested under WP 6.2 is designated to cover these costs as well as the IUWM planning process.

The first workshop (Data Analysis) will be planned in Alexandria between September – October 2008. At first, it was planned that the draft City Water tool would be available but this will not be the case before month 35. The idea therefore is now to use this workshop to discuss with the LA the research results so far produced within SWITCH, in the context of strategy development (together with WP 6.2) ,discuss with the LA the specifications of the City Water tool (together with the other workpackages in Theme 1). Specific objectives include:

- Assess the current status of SWITCH in Alexandria:
  - LA work in Alexandria
  - RIDA analysis results and the WRA report (IRC)
  - Simulation results of the current situation in Alexandria using Aquacycle (NTUA)
- Discuss needs of Alexandria LA from City Water and application requirements (Theme 1 partners, interaction between SWITCH partners and LA members)
- Define expectations from the IUWM plan

The second workshop (Data analysis and City Water -Information Sharing Platform) will be planned in Alexandria for November 2009. It will combine D1.4.9 (Training package on City Water). Specific objectives include:

- Present City Water to Alexandria LA (Theme 1 partners)
- City Water to be perceived and discussed as a tool towards the formation of the IUWM plan (Interaction between SWITCH partners and LA members)
- Provide training on City Water (Theme 1 partners)

The third workshop (New City Strategy for Urban Water Management) will be held in Alexandria in the last year of the project. Final Workshop – End of Project – November 2010. Specific objectives include:

- Present City Water results for Alexandria (Theme1 partners)
- Explore Possibilities for LA members in using City Water after the end of SWITCH programme (Interaction between SWITCH partners and LA members)
- Present the IUWM plan (SWITCH partners)
- Commit on final reporting (what to include, who is doing what) (interaction between SWITCH partners and LA members)

The budget-partners in this WP have resources to produce the deliverables, but not necessarily for the workshops. That is why additional funding is requested under wp6.2 for these workshops. The workshops are part of a process that leads to the production of a new city strategy. This city strategy will be a worked-out strategic plan indicating the strategic direction that water management in the city should take. Both the strategic plan and the strategic direction should be based on research and demonstration results from the SWITCH project. The translation of these results into a strategy is one of the actions required. To coordinate a fully worked-out strategic plan much more resources are needed, at least one full time senior person, with supporting staff and inputs from the LA institutions.

Specifying Inputs

Activities	Work Description	Contributions
Preparation of the Workshops	Responsibility of Demo city coordinator/facilitator (3 weeks per workshop). The maximum number of workshops in the demonstration cities in the period M25-42 is 3, depending on which workshops have been held already before M25.	NTUA: Contribute in Planning (Agenda, participants from SWITCH) & Provide training on tools (if and when required) during the Workshops
Reporting of the Workshops	3 days per workshop	Shared effort between CEDARE ,NTUA, IRC
Preparation of the strategic direction document	At least 2 weeks per year	Reporting by CEDARE. NTUA & IRC to provide feedback on Theme 1 planning for Alexandria for the coming year.
Logistics	Venue and other organization costs	CEDARE , EC contribution (IRC, UNESCO-IHE?)
Participation in training event in Delft	1 week and travel costs - A training in scenario planning – strategy development will be organized, jointly with 6.2 in Delft mid 2008	CEDARE – Theme 6 facilitator, EC contribution (IRC, UNESCO-IHE?)

Workpackage 3.1 (Water Demand Management)

CEDARE provided a training in November 2007 on Water Demand Management. Part 2 of this training will take place in May 2008. In between the two trainings, data will be collected and compiled by the participants so that an assessment of the situation can be made, and thus a comprehensive look at how to proceed in WDM from now on. This training was attended by middle-management representatives from the water companies and wastewater companies of all governorates across Egypt, as well as representatives from the Ministries of Water Resources and Irrigation, and Housing. The training also includes members of the Alexandria learning alliance. It will provide training in end-use analysis, least-cost planning and demand management planning best practice. It gave a clear view on the reality of the data gaps that need to be collected in order to start a good water demand management cycle in Alexandria, as well as in the other governorates. The second component of the "Water Demand Management" Training will culminate the exercises for 'water demand management' as well as incorporate all the missing data gaps that need to be assessed when compiling an Integrated Urban Water Management (IUWM) Plan.

Deliverables for Workpackage 3.1

D.3.1

1. The second component of Water Demand Management training will take place in May 2008.
2. A report on the culmination of the training will be produced.
3. Process Documentation is in progress during and throughout the trainings.
4. A study in collaboration with theme 1 and D6.2.14 will be produced under D6.2.14 on WDM in Alexandria. Data and methods obtained from the trainings will be used to help the contents of this report. This study is aimed to enhance the progression of the IUWM Plan in Alexandria.
5. Materials CD and distribution to LA and other participants

Workpackage 6.1 (Institutional Change)

CEDARE will complete an institutional mapping assessment for the City of Alexandria as a whole, including governance issues with respect to legal frameworks of organizations and their liabilities. Institutional mapping assessment requires training of personnel to fulfill such a task and clear and explicit criteria need to be labeled for this task.

Deliverables for Workpackage 6.1

D6.1.2

- CEDARE is in the process of beginning to prepare an institutional mapping report which will build upon the Stakeholder Analysis Report in Alexandria.

- Preparation of TOR for Alexandria Institutional mapping is in the process of beginning to prepare an institutional mapping report which will build upon the Stakeholder Analysis Report in Alexandria.

D6.1.5

- CEDARE has contributed to a better understanding between the stakeholders and the institutions for cooperation and coordination with the LA to promote the IUWM Plan and work towards it through several LA meetings where institutional rules have been clarified and activities and plans of different institutional have been shared.
- CEDARE has reviewed a series of papers on institutional aspects for communication and enhancement of IUWM including:

1. Communication for Social Change: An Integrated Model for Measuring the Process and Its Outcomes, by Maria Elena Figueroa, D. Lawrence Kincaid, Manju Rani, Gary Lewis.
2. Governance: Literature Review, by Colin Green
3. Mapping the field: the landscapes of governance, by Colin Green
4. Institutional Maps, by Colin Green.
5. Where are Institutions? By Geoffrey M. Hodgson
6. Overview: the Watertime project and the construction of the final recommendations and decision aid, by David Hall
7. The New Institutional Economics of India's Water Policy, by Tushaar Shah

- CEDARE has managed to agree with the LA and negotiate with the Alexandria Governorate to formalize the role of the LA as an advisory committee to guide in the IUWM.

D6.1.6

- This report will work in collaboration with D6.2.14 to work towards good governance for an IUWM Plan. This will be prepared in year 4 and 5 of the project.

Workpackage 6.2 (Learning Alliances)

Water Awareness Event: March 2008

This event will coincide with World Water Day, and will be held on two separate days. The first day will be held in collaboration with the Ministry of Water Resources and Irrigation (MWRI) at the Ministry on the 22nd, while the second day will be held in Sawy Cultural Center in collaboration with the Egyptian Water Partnership (EWP) NGO on the 24th. Both events will be targeting end users with special emphasis on women and children. The two days will encompass a series of events such as skits or a show on water conservation behavior mechanisms, as well as simulated Parliament for Water by children discussing water issues. The SWITCH project will be publicized in this event through the dissemination material that will be given away at both events. Packages with water conservation material will be produced and disseminated for sharing among the end users in these events. The SWITCH logo will be placed on these packages and information on the SWITCH project as well as the local work in Alexandria will be provided in these packages.

Deliverables for Workpackage 6.2

D6.2.4 Reports on recruitment and training of LA teams (month 6)

- Recruitment of LA took place in January 2007.
- An LA Training took place in CEDARE, Egypt in January 2007.
- The LA facilitator attended an LA training in Lodz, Poland in July 2007.
- The LA co-facilitator attended an LA training in Accra, Ghana in December 2007.

D6.2.5 Institutional analyses focused on the challenges in working towards a paradigm shift and institutional change within each demonstration city (month 6-9)

- Institutions and Stakeholders focused on working towards change within Alexandria and the demo site. (An IUWM Plan)

D6.2.6 Reports on the formalization of the LAs in all demo cities (month 6-12)

- Report on formation in city story
- Stakeholder Analysis report is complete

D6.2.7 Reports summarizing research needs and opportunities for effective research and demonstration activities (month 6-18).

- Technical and Financial Proposal for the Demonstration Site complete with all interventions and budgets needed to fulfill the interventions.
- Identification of research needs for IUWM plan in city story
- Identification of research opportunities for IUWM in Aquacycle

D6.2.8 Regular reports on research activities and related learning and uptake within the LAs (quarterly), including ‚road maps'.

- Visioning Workshop took place in Alexandria in July 2007
  - Report on Visioning workshop complete with process documentation.
  - Report and material CDs disseminated and made available to all.
- Regular LA meeting reports completed for the following meetings.
  - 1st LA meeting (January 2007)
  - 2nd LA meeting (March 2007)
  - 3rd LA meeting (June 2007)
  - 4th LA meeting (January 2008)
- Alexandria LA Regional Partners Meeting (Cairo/Alexandria December 2007)

D6.2.9 Regular reports on demonstration activities and related learning and uptake within the LAs (quarterly)

- LA Progress reports of work achieved to that point.
- 1st LA Progress report complete (June 2007)
- 2nd LA Progress report complete (Dec. 2007)

D6.2.11 Extensive process documentation (accessible through the project internet platforms)

- Process documentation complete for trainings, meetings, and workshops.
- SWITCH Alexandria website launched and active. http://switchalex.wordpress.com , http://switch.cedare.int

D6.2.12 Guidelines for learning and innovation in the context of IUWM (Month 4 draft and month 60 final)

- Travel between the cities should create information exhange and learning and innovation within the context of IUWM.
- Media coverage of SWITCH project:
    - Press releases of ALL trainings and workshops done so far
    - TV Interview with BEATTY environment Channel on SWITCH project
    - TV Interview with Alex TV on SWITCH project
    - Radio coverage on SWITCH project

D6.2.13 Journal papers on analysis of LA learning processes (5 by Month 60)

- CEDARE will contribute to the papers written by the partners to produce journal papers with analysis of LA learning process. This will be joint work between IRC and CEDARE.

NEW DELIVERABLE: D6.2.14 Formulation of an Integrated Urban Water Management (IUWM) Plan for the City of Alexandria (by Month 60). Deliverable achieved in coordination and collaboration with theme 1 specifically wp 1.1 and 1.2, with partners from these workpackages. The lead partner of this deliverable will be CEDARE, with close cooperation and collaboration from IRC, and NTUA. Budget for this deliverable seen further down in document.

Components:

C6.2.14.1 Framework for IUWM Plan

- Water Resource Assessment (WRA) and DSS development Trainings in Alexandria and Athens (by NTUA). TheWRA and DSS work should last till July 2009.
- Three workshops from Month 25 till Month 60 on City Water and IUWM planning (See also above description of workshops in theme 1.1).

C6.2.14.2 Research and studies on storm-water potential, wastewater reuse, water demand management, and water cost recovery (4 research studies to be completed by 2010).

WRA and DSS contents:

The following proposals are made in response to points made during the LA meeting on 23 January and the WRA and DSS planning meeting on 24 January:

1. Local specialist support in Alexandria. Specialist support, comprising a part-time senior water resources management specialist and a post-doctoral student, should be contracted to work on the WRA and the DSS. In parallel to this specialist water management support, a part-time senior facilitation specialist, based in Alexandria, to strengthen the facilitation of the overall SWITCH process.
    - The water management specialists will coordinate support with the overall SWITCH process facilitation specialist and the CEDARE LA support team, and work in close consultation with the Alexandria LA member organizations, CEDARE (Cairo), IRC (Delft, The Netherlands) and the National Technical University of Athens;
    - The water management specialists will provide the central contact point in Alexandria for all involved in WRA and DSS work and address any arising problems;

- Under the guidance of the overall SWITCH process facilitation specialist, the water management specialists will ensure that maximum use is made of information and knowledge held by any relevant stakeholder within and outside.

2. Training and capacity development. A training and capacity development programme be carried out that builds capacity within the LA in the development and operation of DSS that can be used as one mechanism of embedding integrated urban water management in Alexandria.

Deliverables from WRA and DSS work

The deliverables from the proposed Alexandria WRA and DSS work will include:

- A set of Resource, Infrastructure, Demand/Access (RIDA) tables that will provide a schematic and numerical overview of Alexandria's water service delivery systems. This will include putting numbers (along with measures of uncertainty) on the RIDA schematic that has already been produced for Alexandria (see Figure 1).
- An integrated urban WRA for Alexandria Governorate. This will be similar to the recent water resource assessment for the Maltese Islands that involved IRC staff. This report can be downloaded from: http://www.fao.org/docrep/009/a0994e/a0994e00.htm.
- A functional version of the AQUACYCLE Model that has been set up to work in Alexandria This model was described in the paper presented by Stella Apostolaki at the second SWITCH scientific and integration meeting (November 2007).
- An IUWM Strategy Evaluation Report that uses modelling and outputs from the WRA to evaluate the potential scale and range of benefits/beneficiaries of different interventions and strategies. This report will also evaluate potential positive and negative externalities associated with different interventions and strategies.
- A functional version of the CITYWATER DSS that will support IUWM decision making and complement software that is currently in use (e.g. Watercad and Sewercad).
- A cadre of professionals who have the skills and capacity to use and upgrade the CITYWATER DSS.
- Process documentation providing evidence and lessons learned of this innovative inter-disciplinary and multi-stakeholder way of working (lead by the senior facilitation specialist and IRC support)

See requests for budget below at the end of the document.

Workpackage 6.3 (Social Inclusion)

CEDARE will link with work packages 6.2 (Learning Alliances), 6.4 (Finance & Cost Recovery), and 1.1 (Sustainability Indicators) to identify all the stakeholder groups, with specific attention to those groups currently under-served, for improved integrated urban water management and to conduct a participatory needs identification and prioritization with those groups. Based on the outcomes of the prioritization activity, to plan pro-poor measures that seek to enhance the opportunities for these stakeholders' participation in the Learning Alliance decision making processes and to develop a locally tailored

assessment methodology for measuring the impact of the pro-poor measures with regards to technical, economic, social, environmental, etc indicators. Social inclusion will be focused in the demonstration site in Alexandria, being the Fishing Village of Ma'awa el Sayadeen. The areas of potential that will be explored there include:

- Making use of rainfall harvesting and storm water usage in Alexandria.
- Making use of groundwater while managing potential problems of salt water intrusion.
- Water demand management measures that could be considered to reduce water requirements.
- Wastewater treatment and reuse options
- The enforcement of regulations to prevent industrial pollution of water bodies.
- Emphasis on ensuring that the poor are served;
- Commercial viability of utilities;
- Separation of provider and regulator;
- Increasing role of the private sector through a variety of methods, ranging from management contracts to full privatization;
- Developing approaches which distinguish between the large city and the peri-urban areas;
- Emphasis on transparency of process
- Reforming legal and institutional frameworks;
- Capacity building for regulators;
- Promote better policy, regulatory, and institutional frameworks for sustainable environmental management;
- Greater attention to rights and market-based instruments;
- Attention to possible climate change impacts;
- Promotion of Strategic Environmental Assessments to move "upstream" in the decision-making cycle;
- Promoting environmentally and socially sustainable private sector development;
- Focusing on the positive linkages between poverty reduction and environmental protection;

Deliverables for Workpackage 6.3

D6.3.1 Baseline reports on current water situation in demonstration project areas including: levels of cost recovery and current tariffs; data on access to, use of and control over (e.g. positions in management and decisions about use, payment, etc) services by women, poor, children, and other vulnerable or marginalized groups – including also information about whether these issues are currently measured, included in planning for water services, and assessed and monitored in the demonstration cities (M6)

- A Baseline Survey will be investigated on the demo site, and a baseline report will be written with the outcomes and conclusions of this survey.

D6.3.2 Case studies on selected approaches or methods to optimize social inclusion (M12)

- Case Studies investigated and report compiled, written and approval taken on report. (Complete).

D6.3.3 Experiences and learning are shared within and among stakeholders in participating cities via range of media including: project website, flyers, workshop

reports, guidelines, video/audio documentation, etc (linked to Work Package 0.2 Dissemination and Training)

- SWITCH Alexandria website launched and active. http://switchalex.wordpress.com, http://switch.cedare.int
  - Documents will gradually be loaded onto the Internet for all to view.
- Documentation of trainings and workshops complete.

D6.3.4 Process documentation on how Learning Alliances facilitated the development of adaptive, socially inclusive, management actions (linked to WP 1.2 Access to and use of Knowledge and Dissemination)

- Technical and Financial Proposal of Demo Site Report based on Social Inclusion (complete).
- Process documentation is in progress.

D6.3.5 Report on training Learning Alliance members and the research teams on socially inclusive, participatory planning and management (Participatory Planning Cycle Management and Qualitative Information Systems methodology) – IRC together with local counterpart.

- A Social Inclusion Workshop will be done in August 2008 with all the LA members and participating bodies.
- A report on the Workshop will be compiled for documentation.
- A Situation Analysis report will be compiled and written once the work of Social Inclusion is complete to see the impacts of Social Inclusion before and after.

Workpackage 6.4

Deliverables for Workpackage 6.4

D6.4.1 A conceptual framework for evaluating the financial side of the relevant infrastructure in the demo projects and selected cities.

- Discussed ToR with Emanul and Rachel
- Regional partner will be working on this deliverable with support from CEDARE.
- CEDARE has reviewed a series of papers for communication and enhancement of IUWM including:

1. Water, Ethics, and Economics, by Colin Green
2. Is water Different, by Colin Green
3. The New Institutional Economics of India's Water Policy, by Tushaar Shah

D6.4.2 Reports on the demo projects and selected cities on the different ways of financing the relevant infrastructure and the cost recovery system chosen.

- Discussed with wastewater company and governmental on cost sharing prepared proposed
- Regional partner will be working on this deliverable with support from CEDARE.

D6.4.3 A study of the institutional arrangements chosen in the different demo projects and selected cities to obtain finance and to assure cost recovery

- Regional partner will be working on this deliverable with support from CEDARE.

D6.4.4 A comparative study on different financial approaches and instruments used and the cost recovery systems put in place and their success.

- Regional partner will be working on this deliverable with support from CEDARE.

Achievements from M13 to M24

Achievements from M13-24				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Date Achieved**
2nd LA Meeting			• List of Issues • **D6.2.6/6.2.8**	2nd LA meeting took place on March 14, 2007
3rd LA meeting Visioning Workshop on SWITCH approach & scenario planning	Identify UWM challenges, possible measures, and indicators for sustainability		Alexandria City IUWM Vision Future Scenarios discussion document **D6.2.6/6.2.8**	3rd LA meeting took place on June 12, 2007
Social Inclusion Training in Delft	CEDARE participated in training		**D6.3.3**	April 2007
Visioning Workshop	IUWM Vision and Scenario		**D6.2.7/6.2.8**	Visioning workshop took place in July 2007.
Report on Visioning Workshop			**D6.2.7/6.2.8**	Completed and disseminated to all LA members and theme 1 partners in August 2007.
Demo Site Proposal includes SI			**D6.3.4**	November 2007
Learning	Train		**D6.2.4**	LA facilitator

Alliance Facilitation	Alexandria LA Facilitator			and Co-facilitator attended a Process documentation training in Lodz, Poland and a monitoring and evaluation workshop in Accra, Ghana in July and December 2007 respectively.
Report on Stakeholder Analysis	Under wp 6.2	Identifying stakeholders in Alexandria	**D6.2.5**	Completed with revisions in January 2008
1st WDM Training	Train Alexandria & Other cities Professional on WDM, Put WDM on the Political Agenda	Select Professionals to be trained, Provide WDM training	**D3.1**	1st WDM Training took place from 11-14 November 2007.
4th LA meeting	Discuss Demonstration Site and financing of activities.		**D6.2.8/6.2.9**	4th LA meeting took place on January 23rd 2008.
Report on Case Studies for Social Inclusion	Case studies on slum areas in Alexandria		**D6.3.2**	Report completed in December 2007.
Alexandria LA Regional Partners Meeting		P.Bury Travel Report	**D6.2.8/6.2.12**	Meetings in December 2008
RIDA/Aquacycle meetings in Cairo/Alexandria	(RIDA) water resources assessment and develop scenarios modeling process to develop a IUWM strategy	Prepare needed data for modeling.	Report on RIDA/Aquacycle meetings **D6.2.8/6.2.12**	Meetings are to take place from January 20-24, 2008.
TOR for Alex Institutional mapping		Preparation of TOR for Alex Institutional mapping	**D6.1.2**	January 2008
Identification of			**D6.2.7**	January

research needs for IUWM plan in city story				2008
Identification of research opportunities for IUWM in Aquacycle			**D6.2.7**	January 2008
Reports reviewed on institutional cooperation		Reports on Institutional cooperation and coordination	**D6.1.5**	March 2007
Reports reviewed on conceptual framework for financial evaluation		Reports on financial evaluation	**D6.4.1**	March 2007
Media Coverage of SWITCH project			**D6.2.12**	September 2007

Planned Activities for M25-42

Workpackage 3.1

Planned Activities 2008				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Milestone**
2nd Component of the WDM Training	Complete WDM Training of Professionals, Get Preliminary Indications on WDM Potential in Cities	Provide Training, Compile WDM preliminary data, Analyze data, Recommend best WDM measures for cities	**D3.1**	May 2008
Report on WDM Training - Documentation			**D3.2 /3.3**	May 2008

Existing Budget Allocation M25-42

Workpackage 3.1	Total Budget

2nd Component of WDM Training	6500
Total	6500

Workpackage 6.1

Planned Activities 2008				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Milestone**
Report on Institutional Mapping Analysis			**D6.1.2**	June 2008

Existing Budget Allocation M25-42

Workpackage 6.1	Total Budget
Deliverable 6.1.2	
Reporting on Institutional Mapping Analysis	8000
Total	8000

Workpackage 6.2

Planned Activities 2008				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Milestone**
Water Awareness Event	(public awareness)		**D6.2.11/6.2.12**	March 2008
LA quarterly progress report			**D6.2.8/6.2.9**	March 2008
Set up SWITCH Alexandria office	Office for LA facilitator based in Alexandria.	Prepare equipment for LA office (PC, phone, fax, desk, internet, etc.)	**D6.2.3**	March 2008
5th LA Meeting Discuss WDM measures	Discuss WDM Measures, Discuss outputs for WRA, Discuss demonstration activities and further research needed.	Prepare for WDM Training, TOR for WDM Study in Alexandria	**D6.2.8/6.2.9**	April 2008
Update Alexandria SWITCH City Website			**D6.2.11/6.2.12**	April 2008
WRA training in Alexandria	Hands on training by NTUA		**D6.2.8/6.2.12**	April 2008

Intensive DSS Training and Capacity Development for WRA in Athens	Selected members from the LA to travel to Athens for Training		**D6.2.8/6.2.12**	May 2008
Report on WDM in Alexandria	Specific Study and research to Alexandria		**D6.2.7**	June 2008
LA quarterly progress report			**D6.2.8/6.2.9**	June 2008
Report on Institutional Mapping Analysis			**D6.2.5**	June 2008
WRA training in Alexandria	Hands on training by NTUA		**D6.2.8/6.2.12**	June 2008
6th LA Meeting Storm Water Management & Potential	Discuss Storm Water Management & Potential, Discuss outputs for WRA		TOR for Storm Water Study in Alexandria **D6.2.8/6.2.9**	June 2008
Social Inclusion in IUWM Planning – Workshop	Discuss Social Inclusion in IUWM Planning	Discuss demonstration activities.	Report on Workshop **D6 6.2.9**	July 2008
7th LA Meeting on discussions on Wastewater Reuse Measures	Discuss Wastewater Reuse Measures, Discuss outputs for WRA		TOR for Wastewater Reuse Study **D6.2.8/6.2.9**	August 2008
WRA training in Alexandria	Hands on training by NTUA		**D6.2.8/6.2.12**	August 2008
Report on Storm Water Management in Alexandria	Specific study and research for Alexandria		**D6.2.7**	September 2008
LA quarterly progress report			**D6.2.8/6.2.9**	September 2008
Follow up on Demo site activities			**D6.2.7**	September 2998
Data Analysis Workshop	Wp 6.2 and theme 1 together.	WRAAnalysis results and the WRA report	Simulation results of the current situation of Alex using Aquacycle **D6.2.8/6.2.12**	Sept – Oct. 2008
Intensive DSS Training and Capacity Development	Selected members from the LA to travel to Athens for		**D6.2.8/6.2.12**	November 2008

for WRA in Athens	Training			
LA quarterly progress report			**D6.2.8/6.2.9**	December 2008

Workpackage 6.2

Planned Activities 2009 till M42				
Report on Wastewater Reuse in Alexandria	Specific study and research for Alexandria		**D6.2.7**	January 2009
8th LA Meeting Water cost recovery	Cost Alternative Policy Measures		TOR for Water Cost Recovery Study **D6.2.8/6.2.9**	January 2009
WRA training in Alexandria	Hands on training by NTUA		**D6.2.8/6.2.12**	January 2009
Intensive DSS Training and Capacity Development for WRA in Athens	Selected members from the LA to travel to Athens for Training		**D6.2.8/6.2.12**	March 2009
9th LA Meeting	Develop IUWM strategy	Prepare data and needed outputs for IUWM plan	**D6.2.8/6.2.9**	April 2009
WRA training in Alexandria	Hands on training by NTUA		**D6.2.8/6.2.12**	May 2009
10th LA Meeting	Demonstration site activities researched	Further needs and support to demo site	**D6.2.8/6.2.9**	July 2009

Planned Activities for M43-60

Planned Activities for M43-60 (2009-10)				
LA Quarterly Progress Report			**D6.2.8/6.2.9**	August 2009
Follow up on Demo site activities			**D6.2.7**	Septembe r 2009
Report on Water Cost Recovery in Alexandria	Specific study and research for Alexandria		**D6.2.7**	Septembe r 2009
11th LA Meeting			**D6.2.8/6.2.9**	October 2009
Data Analysis and City Water Workshop	theme 1 work from NTUA	-Present City Water to	**D6.2.8/6.2.12**	November 2009

(TENTATIVE TO BE AGREED FOR LAST 18 MONTH PERIOD)		Alexandria LA -City Water discussed towards formation of IUWM plan -Training on City Water by theme 1.		
12th LA Meeting			**D6.2.8/6.2.9**	January 2010
13th LA Meeting			**D6.2.8/6.2.9**	April 2010
14th LA Meeting			**D6.2.8/6.2.9**	July 2010
Follow up on Demo site activities			**D6.2.7**	Septembe r 2010
New City Strategy for IUWM Plan – Workshop **(TENTATIVE TO BE AGREED FOR LAST 18 MONTH PERIOD)**	theme 1 work from NTUA	City water results presented to Alexandria	Present IUWM Plan **D6.2.8/6.2.12**	November 2010
15th LA Meeting			**D6.2.8/6.2.9**	November 2010

Existing Budget Allocation from M25-42

Activity	total
Water Awareness workshop (end users, gender, NGOs), World Water Day, Printing and Dissemination of IUWM and Awareness Material (March 2008)	4000
5th LA Meeting Discuss WDM Measures (April 2008)	1600
Follow up on Demo Site Activities	6600
LA Progress Reports	7500
Support to papers on LA processes	1150
City Storyline	2200
Process Documentation	7500
6th LA Meeting Storm Water Management & Potential (June 2008)	1600
Social Inclusion in IUWM Planning – Workshop (July 2008)	6500
7th LA Meeting Wastewater Reuse Measures (August 2008)	1600
8th LA Meeting Water cost Recovery(January 2009)	1600
9th LA Meeting – IUWM strategy (April 2009)	1600
10th LA Meeting (July 2009)	1600
Travel expenses for next 18 months	9525
Total	54575

Existing Budget Allocation from M25 till M60

Workpackage 6.2	**Total Budget**
Deliverable 6.2.7	
Follow up on Demo Site activitities	10300
Deliverable 6.2.8	
5th LA Meeting	1600
6th LA Meeting	1600
7th LA Meeting	1600
8th LA Meeting	1600
9th LA Meeting	1600
10th LA Meeting	1600
11th LA Meeting	1600
12th LA Meeting	1600
13th LA Meeting	1600
14th LA Meeting	1600
15th LA Meeting	1600
Deliverable 6.2.9	
City Storylines	4400
Social Inclusion Workshop (July 2008)	6500
LA Quarterly Progress Reports	12000
Deliverable 6.2.11	
Process Documentation	12000
Water Awareness Event	4000
Deliverable 6.2.12	
Travel between cities and exchange of innovations	14369
Deliverable 6.2.13	
Support to papers on LA learning processes	3300
Total	84469

Additional Requested Budget from M25 till M60

Deliverable 6.2.14	
Set up SWITCH Alexandria Office	2000
Alexandria based specialist support	53250
WRA DSS trainings in Athens	6000
WRA DSS trainings in Alexandria (5 trainings)	18750
Study on WDM for IUWM Plan	10000
Study on Stormwater for IUWM Plan	10000
Study on Wastewater reuse for IUWM Plan	10000
Study on water cost recovery for IUWM Plan	10000
Workshop 3-Data Analysis for IUWM (2008)	5000
Workshop 4- City Water and Planning for IUWM (2009)	5000
Workshop 5 – City Water and IUWM (2010)	5000
Interim DSS Report (2009)	5000
Total	140000

Additional Requested Budget from M25 till M42

Deliverable 6.2.14	
Set up SWITCH Alexandria Office	2000
Alexandria based specialist support	53250
WRA DSS trainings in Athens	6000
WRA DSS trainings in Alexandria (5 trainings)	18750
Study on WDM for IUWM Plan	10000
Study on Storm-water for IUWM Plan	10000
Study on Wastewater reuse for IUWM Plan	10000
Workshop 3: Data Analysis for IUWM	5000
Total	115000

Breakdown of Additional Requested Budget from M25 till M60:

Alexandria based specialists support for WRA and DSS development	**Y 2008**	**Y 2009**
Senior water management specialist (4days/month, 350 Euro/day)	14000	12600
Senior process facilitation specialist (1st month 64 hrs then 4 hrs/week, 350 Euro/day)	9100	6300
Post-doc student (Full-time 03/03-08/08, 50% time 09/08 -07/09, 900 euro/month)	7200	4050
Management/organizational fees for time/services/transportation and logistics for trainings	12500	6250
Facilities for LA office in Alexandria	2000	0
Modeling and DSS training and capacity development		
NTUA hands on training in Alexandria (1000 Euro/visit) (travel costs for NTUA to Alex)[1]	3000	2000
LA intensive capacity development in Athens (1000 Euro/person/visit)	4000	2000
Total (Euro)	**51800**	**33200**
Total (Euro)	**80000**	

Note: According to proposal by Peter, Charles, Dionysis, and CEDARE (CEDARE, IRC, and NTUA)

1. NTUA travel costs will not go to CEDARE, but to NTUA.

Year 2008 /2009/2010 : IUWM Planning in Alexandria	
Workshop 3: Data Analysis Workshop (2008)	5000
Workshop 4: Data analysis and City Water (2009)	5000
Workshop 5: New City Strategy for Urban Water Management (2010)	5000
Interim DSS Report (2009)	5000
Total	20000

Note: According to proposal by Dionysis, (NTUA)

Year 2008 /2009/2010 : Reports and Studies in Alexandria for IUWM Plan	
Report on Water Demand Management	10000
Report on Storm-water Management	10000
Report on Wastewater Reuse	10000
Report on Water Cost Recovery	10000
Total	40000

It is more convenient and logical to place the budget for these reports under 6.2, since it should be collaboration with the LA.

Workpackage 6.3

Planned Activities 2008				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Milestone**
Social Inclusion in IUWM Planning – Workshop	Discuss Social Inclusion in IUWM Planning	Discuss demonstration activities.	Report on Workshop **D6.3.3**	July 2008
Report on Social Inclusion workshop – Social Inclusion in IUWM			Report on Social Inclusion in IUWM **D6.3.3 /6.3.4 /6.3.5**	August 2008
Report on Baseline Survey	Dependant on information obtained from demo site and social inclusion workshop		**D6.3.1**	September 2008

Existing Budget Allocation M25-42

Workpackage 6.3	Total Budget
Deliverable 6.3.1	
Report on Baseline Survey	12000
Deliverable 6.3.3	
Social Inclusion Workshop (budget collaboration with 6.2)	1200
Report on Social Inclusion Workshop	5000
Travel Costs	2600
Total	20800

Workpackage 6.4

Planned Activities 2008				
Activity	**Specific objective**	**Task**	**Deliverable Number**	**Milestone**
Prepare a report on demo project interventions financial assessments		Report on Financial Assessment	**D6.4.1**	January 2009

Existing Budget Allocation M25-42

Workpackage 6.4	Total Budget
Deliverable 6.4.1	
Report on Demo site Financial Assessment	7500
Total	7500

Documentation

Report/Document	Status
Scoping report	Complete
LA action plan/ city storyline	Complete
Stakeholder analysis	Complete
Report of visioning workshop	Complete
Quarterly reports	Complete
Process documentation	Complete
Institutional Mapping Report	Gathering of information in process.
Demonstration Site Technical and Financial Proposal	Complete
IUWM Plan	Gathering of information is in process
Report on Water Awareness Event	-
Baseline Survey on Demonstration Site	-
Case Study on Slum Areas for Social Inclusion	Complete
Situation Analysis Report on Social Inclusion	-
Alexandria City Story	Complete

Training

Training activity	**Purpose**	**Target audience**	**Date Achieved**
1st WDM Training October 2007	Train Alexandria & Other cities Professional on WDM, Put WDM on the Political Agenda	Select Professionals to be trained, Provide WDM training	1st WDM Training took place from 11-14 November 2007.
Social Inclusion Training in Delft	Social Inclusion	LA members	April 2007
LA Training in Lodz, Poland	Process Documentation	LA facilitators	July 2007
LA Training in Accra, Ghana	Monitoring and Evaluation	LA facilitators	December 2007
Workshop on Social Inclusion	More Social Inclusion in Decision Making	Learning Alliance Members	Yet to be planned.
2nd Component of the WDM Training May 2008	Complete WDM Training of Professionals, Get Preliminary Indications on WDM Potential in Cities	Provide Training, Compile WDM preliminary data, Analyse data, Recommend best WDM measures for cities	Planned for 11-14 May, 2008.

Dissemination

Dissemination activity	**Purpose**	**Target audience**	**Date Achieved**

Visioning Workshop CD	To disseminate the water pressures and challenges that faces city of Alexandria.	Decision makers and stakeholders in Alexandria	Complete
Water Demand Management Training CD	Disseminate the concept of WDM	Drinking water and sanitation companies all over Egypt, All LA members	Complete
Press Releases	Get Public Support to SWITCH innovative ideas	General Public	Complete and in progress with activities
TV Interviews	Get Public Support to SWITCH innovative ideas	General Public	Complete and on-going
Radio Interviews	Replicate SWITCH in other Cities	General Public	Complete and on-going
Newsletters	Create Awareness on IUWM	Specialists	Complete and in progress with activities
Publish Papers at Conferences	Create Scientific Support to IUWM	Researchers	Complete and in progress with activities
SWITCH Alexandria Website	Provide IUWM tools and methodologies to a bigger audience	Professionals & General Public	Complete and being updated with activities
UNESCO-IHE Conference	Disseminate Information on SWITCH in the Cities	Present Paper on SWITCH Alexandria IUWM at Conference	Complete
A poster for city of Alexandria	To address Alexandria vision, scenarios, main LA members, challenges, pressures, activities and areas to be studied	Other SWTCH cities and partners	Complete and downloaded on the SWITCH intranet website
Water Awareness Packages	Raise awareness on water conservation issues, behavior patterns, and water scarcity.	End users, General Public	In progress at March 22, 24 2008 World Water Day event

Budget/Expense summary – Workpackage 6.2: All Learning Alliance Activities

Year	Funds Available (total)	Funds Used (total)	Staff costs	LA meeting/ event costs	Local costs & other expenses	LA training costs (travel and expenses for participation)	Total Funds Remaining/ Required (EUR)	
Year 1 (Feb 2006 – Feb 2007)	**20,439**	**27,836**	**14,106**	**626.76**	**2,187.00**	**6,276**	**(Required) 7,397**	• Plan 2006 • SWI 2006 • Pre- Infor • City Octo • Scop (Alex • Com colle (Nov • Prep stat mem city • Pres Alex chan Trus Cour
Year 2 (Feb 2007 – Feb 2008)	**41,761** [1]	**37348**	**21536**	**2050**	**1784**	**5763**	**4473** [2]	• SWT Pres at SW Janu • Host Facil Janu • 1st L • 2nd L • 3rd L • LA fa train • Visic • • • enth sect • Com • LA c train • RIDA • 4th L
Year 3	**44710** [3]	-	-	-	-	-	-	-

(Feb 2008 – Feb 2009)								
Year 4 (Feb 2009 – Feb 2010)	**20301** [4]	-	-	-	-	-	-	-
Year 5 (Feb 2010 – Feb 2011)	**19379** [5]	-	-	-	-	-	-	-

Notes:

1. 22,011+19,750 = 41,761. The 22011 refers to the sum for wp 6.2 from the original budget. 19,750 refers to half of the additional funds of 39500 for LA facilitation. The 39500 is to be used from month 19-30, thus 19750 was used from month 19-24 (second half of yr 2).
2. 4473 EUROS to be used in year 3 for 6.2
3. Additional request of funding is listed above.
4. Additional request of funding is listed above.
5. Additional request of funding is listed above.

SWITCH City Story Beijing

Description of the city and its water resources

Beijing

Beijing is the capital of R.P. China. It enjoys a moderate continental climate and has an average rainfall of about 500mm yearly. The temperature is in the range of -15-38 °C. Beijing is covering an area of 16,808 sq. km and is divided into 16 districts and 2 counties. In 2004, Beijing had a population of more than 14.5 million, of which 3.2 million people in the peri-urban districts and counties of the metropolitan area. The core of the city includes 4 districts with about 87.1 sq. km and a high population density of 27506 persons/sq. km. In the peri-urban area of Beijing the population density is about 161 persons/sq. km. Beijing is a very water-scarce city, the per capita fresh water resources are about 300 cubic meters per year, i.e. one-30th of the world's average. It is foreseen that the available water resources will not meet the increasing water demand in the near future, due to increasing population and decreasing groundwater resources. Beijing has decided to direct businesses which consume large amounts of water out of the city, including irrigated agriculture, which would deprive the livelihoods of vulnerable group of people, notably migrant farmers. The goals of what needs to be achieved in the water sector according to the 11th five-year plan are ambitious. However, the shift in focus to the rural areas, bring along several opportunities and challenges. The productivity of agricultural land in periurban Beijing has increased and traditional farming has gradually given way to more intensive production systems often linked with agro-enterprises that undertake the processing and marketing (herbs, vegetables, animal products, flowers, tree seedlings, pot plants, etc.). Other functions of the periurban areas of Beijing have also become more important. For instance, agro-tourism in periurban Beijing has made great progress in the last decade and generates new income opportunities for the farmers. There are currently about 4 million migrants in Beijing, of which about 3 million are employed in various economic sectors, including about 100,000-200,000 employed in urban agriculture. Most migrant farmers are renting land and producing vegetable in the peri-urban areas.

Chongqing

Chongqing is located in the southwest of China and has become the most important economic and cultural centre in the upriver of Yangtze River and Three Gorges Area in the last years. After being granted MCG status, Chongqing restructured it territorial and administrative organization. Chongqing MCG greatly expanded its administrative boundaries. With the territorial adjustment in 1998, Chongqing absorbed more land and population and made it the China's biggest municipality in terms of area and population. Population in Chongqing doubled from a total of 15 million in 1995 to 31.1 million in 2003. According to the Chongqing Master Plan of 1996-2020, residents will be accommodated in an urban hierarchy consisting of one mega-city (with a population of about 5 million), two large cities (Wanzhou and Fuling with populations of more than 0.5 milion each), nine middle-sized cites, 33 small cities and 709 towns (Chongqing planning bureau, 1995). Water pollution in Chongqing is very serious. In 2002, the discharge of wastewater was around 43.95 billion ton of which less than 20% was treated. Infrastructure construction for sewage treatment lags behind.

In the integrated urban water cycle, water resources management, drinking water supply and waste water treatment form three important parts, with each specific problem in China. The water situation in China can be characterised by water scarcity and environmental degradation. In particular in Beijing and in the north in general, there is not enough water for the different types of use and for the big cities. Storm water management is also an issue in China's cities, but currently not covered by the SWITCH project. Water scarcity, depletion of underground water stocks and environmental degradation are important issues of the fast-growing cities in China, such as Chongqing, and will be high on the future agenda, which means the SWITCH project comes at an appropriate moment. The involvement of the Ministry of Construction in the project means that the findings of SWITCH can have a national influence.

Main water pressures and issues

The main challenges are:

- The long-term sustainability of the urban water cycle is at risk. Most of the risks are associated with increasing water scarcity (the lowering of the water table in Beijing) and environmental degradation.
- Prices of water are not realistic and lead to uncontrolled use. Efforts to increase the water prices have not been approved by the Municipal Commission of Development and Reform (in 2004).
- Managing the urban (water and land) systems in a more optimal way.
- New and innovative planning is required, using participatory methods and integrating multiple use of the land.

Learning Alliance Coordinator:

Prof. Cai Jianming, IGSNRR
With Prof. He Qiang, Chongqing University

Learning Alliance members

Ministry of Construction and Housing, Department Science and Technology: Mr. Wu Yong (proposed chairman)
IGSNRR, Prof. Cai Jianming (coordinator LA Beijing)
Prof. Jia Shaofeng (facilitator)
Prof. Li Lijuan
Post-doctor: Lu Aifeng
Mr. Ji Wenhua (Ph.D. candidate)
Mr. Li Jiuyi (Ph.D. candidate)
Chongqing University: Prof. He Qiang (city coordinator for Chongqing)
Prof. Zhai Jun
Beijing Water Bureau (Water Savings Office): Dr. Zuo Jianbing
Water Resources department of the Ministry of Water Resources: Guan Enhong
Beijing Hydraulic Research Institute: Ye Zhihan
Beijing Water Environment Protection Bureau: Dr. Wang Yan
Beijing Normal University-WUR: Dr. Zhang Mingshun
Professor Liang Jinshe
China University of Geo-sciences: Dr. Wang Jin

Beijing Demo city:
Xiedao Group: Mr. Fu Xiuping (President),
Huairou Grape Cooperative : Ms. Zan Xiaojing and Mr. Zhao Qingzhong (Chairperson)

Others actors in Beijing and Chongqing
Add 6.1 and 6.4: Meine Pieter van Dijk
Add 3.1: Gary Amy (to be identified)
Others to be identified

Issues, goals and aspirations

To tackle the main challenges facing Beijing's water management, the following LA or trainings/workshops need to be conducted:

- LA training on Visioning planning of water management in Beijing, the goal of the training is to let the participants to play their roles in future in a more comprehensive way instead of neglecting the whole picture when their make decision from their own stand.
- Training on Fundraising and Budgeting planning in order to provide good approach for participants in their fundraising in the future.
- Workshop on Eco-sanitation adaptation and application in Beijing and Chongqing technically and

institutionally. The cost-effect analysis needs to be emphasized in the workshop.

- Workshop on water management through price change and other means. The purpose of the workshop is to exchange the ideas and best experiences between participants in their water management practice.
- Workshop on rain water harvest technologies and economic analysis

SWITCH in the City

SWITCH in Beijing will seek to develop scenario's for the sustainable city of the future. Innovative approaches in urban water management and multiple water use will be integrated in urban planning of this challenge.

The strategy taken in Beijing is to start with a Learning Alliance at sub-theme level at first (both in Beijing and in Chongqing). The Learning Alliance at higher, integrated level (Beijing, Chongqing and potentially national) will be gradually developed. Followed by the first larger LA meeting on awareness-raising and strategy taken in the following years, more LA training workshops will be held in the following 18 months, which is the crucial period for the project implementation.

As mentioned above, two LA training workshops will be held, i.e. Visioning planning, fundraising planning and budgeting management.

Besides the LA workshop, several small workshops on the specific subjects will be held too among the multi-stakeholders and working partners, as we did in the last 12 months. More importantly, in the coming 18 months, two Ph.D. researches on rain water harvest analysis and regional water management in greater Beijing will be focused and emphasized along the development of demo project on rain water harvest in Huairu Fruit and Vegetable Cooperative.

Based on these training workshops and intensive researches, more policy oriented papers or reports will be produced and hand to the relevant decision-makers.

Again, it is agreed that the two cities will focus on one theme each, i.e. Beijing on water use for urban agriculture and Chongqing on Ecosan and decentralised wastewater reclamation. Starting from 3rd year, two institutes should be well coordinated and held more Leaning Alliance workshop in order to exchange information and generate knowledge in urban water management for the municipal government and key water users in the cities.

A further discussion on LA training workshop on Vision planning, possibly held in Beijing in the first week of April , will be held with other SWITCH actors. The participants will be mainly the boundary partners, including the government officials, of SWITCH Beijing and Chongqing.

In addition to the above LA workshop, another international LA workshop on fundraising, budget management and marketing will be prepared to held in Beijing.

If possible, a workshop on eco-sanitation could be held in Chongqing too, depending on the overall budget.

Major activities and impact of SWITCH in the second 12 months

The main activities developed during the second 12 months focused on the awareness of SWITCH program among the main partners and the strategy approach for the program and its phased targets. The main activities and issues in 2007 were the following:

- The first learning alliance meeting on the raising awareness and strategic planning for Beijing and Chongqing was held in IGSNRR in May 2007. More than 20 participants attended the meeting, including 6 SWITCH international actors, 4 government officials, 4 professors, 4 Ph.D. students directly involved in the program, and many other Ph.D. and MA students. Deputy Director of IGSNRR, Professor LI Xiubin and professor Carol Howe, the global coordinator of SWITCH program, presided the meeting with the support of Prof. Cai Jianming, the city coordinator of Beijing. Dr. WU Yong, deputy director general of Science and Technology Bureau in the Ministry of Construction, the Chairperson of SWITCH LA in China, presented a welcome speech. Other SWITCH actors, including Professors Meine Pieter van Dijk, Adriaan Mels, Chris Jeffries and Marc Soutter, and governments officials from very water management departments, including Dr. Guan Enhong (Water Resources department of the Ministry of Water Resources), Dr. Zuo Jianbing (Water Conservation office of Beijing Water Authority) and Dr. Ye Zhihan, made presentations respectively.
- Rene van Veenhuizen paid a follow-up scoping 2 days visit right after the 1st LA meeting in May 2007. The purpose of the scoping visit was to further identify the demonstration sites and the possible issues needed to be addressed, as well as the initial workplan for the coming 18 months and how to catch up the schedule as planned as beginning.
- Up to 3 information meetings with Chongqing partner were conducted in 2007, when various issues on cooperation between two partners were discussed and planned.
- Miss Feifei Zhang, the current facilitator of SWITCH China, attended the LA workshop in Lodz of Poland in July, 2007, in order to learn more skills in documenting and reporting.
- A small LA meeting between IGSNRR, Xiedao Corporation, and a Ph.D. student, Xiao Liang, from the Netherlands, involved in WP 6.1, was held in August. Through the meeting and coordination, an intensive survey on comprehensive water recycling use, rain harvest and water management was conducted in following days, in order to collect the data for social economic analysis.
- 3 meetings with local working partners and network partners were held in Beijing in 2008, respectively in June, August and October. The purpose of the meetings is to decide the work plan of demonstration in Huairu for the rain harvest.
- Followed by the meetings, a series preparation was conducted, including the design of the rain harvest pond and attached facilities, training construction workers for building the facilities based on the general design during November and December 2007. In the due time, the construction of the main pond for harvesting rainfall was completed.
- It should be stressed, during the preparation of the domo construction, a field study training on rain water harvesting and multi-functional use of the facility was conducted too, in which two partners in charge of the demo for rain water harvesting, Mr. Zhao Qingzhong and Mrs. Zan Xiaojing, the participants of the first LA in May, was sent to Shandong and Hebei provinces to learning the related technology, including in addition to growing the grape, the possibility of growing mushroom by using the rain harvesting pond during the winter time, when the pond could be empty.
- Field trips in greater Beijing areas for understanding the water resources and water system in the region, in order to put water forward the water resources management for the region. This will lead to a Ph.D. thesis, which will be fulfilled by Li Jiuyi, the Ph.D. candidate in IGSNRR under the supervision of Prof. Li Lijuan.
- Many filed trips in Beijing were conducted in order to understanding the best water use models so far in the region, including the water saving and rain water harvest practices in Beijing
- Finalized further the review paper on water resources in Greater Beijing region and Beijing municipality.
- Draft paper writing on water use and toward a demo project on rain harvest.
- Preparation Website was conducted.

Results February 2007 – January 2008

- Consolidation of research groups in WP's in Beijing and Chongqing
- Research issues are further identified, i.e. water resources management in Greater Beijing region; Water saving and Rain water harvest in Beijing municipality, and eco-sanitation demonstration in Chongqing municipality
- Several LA meetings held in order to strengthening the cooperation between different stakeholders
- Review papers on water resources in Greater Beijing and Beijing Municipality was finalized.
- Paper on water use management and rain harvest demonstration in Huairu Site was drafted.
- Demo project in Chongqing was under going
- Rain harvest demo project in Huairu was under going, water collection pond has been constructed.
- Website materials is going accumulation.

Linkages of SWITCH with other regional/city water initiatives

- IGSNRR is a member and one of coordinators of the Chinese Association on Urban Agriculture.
- The Ministry of Construction has awarded a proposal for additional research into ecosan / decentralised wastewater management that was proposed by Chongqing University and Wageningen University. This research will focus on water-saving toilets.
- IGSNRR is the headquarter of Center for Water Resources Research of Chinese Academy of Sciences, and has setup a joint research center on water issues with the Australian Academy of Sciences
- Chinese Academy of Sciences has established a joint research center on urban sustainable development with Arizona State University, in which IGSNRR and the Research Center on Ecological Environment are the two poles for the cooperation. Water issue is one of the key issues in the joint center research.
- IGSNRR is one of partners of the Eco-sanitation China Node, which is promoted by SIDA and China Environment Protection Association.

The NEXT 18 Months

Summary of the main points/focus of SWITCH activities in the next 18 months

Planning of next 18 Month

The main focus for the next 18 months will be: the further solidification of the LA process by inviting more stakeholders, particular city level of decision makers to formulate the possible policy initiatives; the further research in-depth on water use in Beijing municipality, including the best practice models and international experiences; further dissemination of research results between multi-stakeholders; further implementation of demo projects both in Beijing and Chongqing on rain water harvest and eco-sanitation respectively.

In the next 18 month period (1 February 2008 – 30 June 2009) the following activities are foreseen:
-**Three LA missions** with 3 workshops in Visioning for an IUWM; 2 workshops on Fundraising/budget planning and 1 workshop on Soil sanitation in Beijing, and 1 possible workshop on Eco-sanitation in Chongqing
-Coordination of continued activities of WP's 5.2 , 4.1 and 6.1;
-Further **field trips and chapters writing** in Greater Beijing and Beijing municipality **for Ph.D. thesis** on rational water resources utilization, water saving and water management
-**Exchange of information** of ongoing research in Beijing and Chongqing: information on the SWITCH website and folder in Chinese (pending funding);
-Organization of **meetings** between LA partners in Beijing and Chongqing for various topics and subjects
-**Dissemination** of information and policy initiatives

Specifically:
-For WP 5.2: Further implementation of the **demo-project in Huairu** with stakeholder working groups. Ongoing research. Development of UA magazine in Chinese;
-For WP 4.1: Implementation of the **demo-project in Chongqing**, stakeholder workshop to review the design and implementation
-Link research WP 6.4 to research on water for urban agriculture.
-Facilitation and support to WP 1.1: evaluation of indicators and visioning planning (for water supply, sanitation planning and management, linked to use for urban greening and agriculture) as a cross cutting issue: GIS based decision support tool (under the larger aim of sustainable urban planning)
-Consolidate the BH Learning Alliance (WP 6.2)
-Input more materials and information to the website by documenting and reporting timely the activities in China
-Translate some SWITCH materials into Chinese if needed by other stakeholders

Challenges
The challenges foreseen in the next 18M period will be:
-To establish a city level LA in Beijing and information disseminate information in Chinese
-To conduct Ph.D. researches in-depth
-To establish good linking between the experiences in Beijing and Chongqing.
-To coordinate various LA workshops
-To implement the demo-projects smoothly

Issues to be addressed (be as specific as possible – eg not Stormwater)

-How to distribute the regional water resources rationally in Greater Beijing;
-How to effectively use water, particularly in urban agriculture in Beijing municipality, through various means, including grey water utilization, water recycling and rain water harvest, etc.
-How to improve people's quality of life and promote sustainable development by adopting eco-sanitation practice and other approaches

SWITCH goals and objectives – Impact to be realised

-To establish an active LA network on water issues in Beijing and Chongqing institutionally
-To improve the water management in Beijing and Chongqing with a multi-stakeholders approach
-To improve urban planning and urban development in Beijing and Chongqing from the perspective of integrated water use and management
-To seek best models and technologies for water use in Beijing and Chongqing through the international cooperations

Learning Alliance Activities *(Could be table include workshops of LA with researchers or only LA, development of a MOU or other charter type, terms of reference instrument, training activities, conferences, etc.))*

Activity
Specific objective
Task
Deliverables
Milestones

-Visioning planning workshops

- Training of trainers (March 2008). Train 2-3 Chinese trainers in English so that they can train other participants in Chinese later. The possible deliverable/mille-stone is that the training materials will be put in Chinese before the next workshop.
- Scenario analysis and visioning planning (April-May 2008). About 12-15 participants will be trained. Some necessary field trips will be made.
- New development strategy for Beijing water management (March 2009). A preliminary strategic water management planning will be formulized as a good basis for policy initiative.
-

-Fundraising/budget planning workshops (to be decided)

- Training of trainers (April 2009). Train 2-3 Chinese trainers. Chinese training materials will be produced.
- Fundraising planning (May-June 2009). About 15 participants will be trained.

- Water supply and Sanitation workshop

- Soil-based Natural systems for Drinking water and wastewater treatment (February 2009). More than 20 participants will attend the workshop. Possibly 5-8 papers will be exchanged in the workshop, following by a day trip in Beijing for the subject.

-SWITCH Scientific Meeting in Beijing (September 2009, to be decided by SWITCH Scientific Committee)

- Various sections will be organized and exchanged (to be detailed once the application is approved by the Committee.

Research activities

Table on specifics of work activities

Work package
Specific objective
Task
Deliverables
Milestones
Lead Partner

WP 4.1 *Adoption and performance of non-conventional wastewater management schemes*

- Case studies and research undertaken.

- Presentation and discussion in LA
- WUR (4)

WP 5.2 *Performance of rainwater harvesting and wastewater re-use technologies*
- Finalization of various Chapters in Ph.D. thesis
- Presentation and discussion in LA
- Organization of working group, training and meetings of multi stakeholder working group
- Action research on demo-project (cost-effective for rainwater harvest, etc.)
- co-editing of UA magazine in Chinese(IGSNRR with ETC (3))

WP 1.1 *To develop sustainability indicators addressed to urban water management and to apply them to current projects in Beijing and Chongqing.*
- Set of indicators of sustainability adequate for application at the Beijing context.
- Studies and research undertaken.
- Presentation and discussion in LA
- UNESCO-IHE with Swiss

WP 6.4 *Financing Cost Recovery and institutional models*
- Case studies and research undertaken.
- Presentation and discussion in LA
- UNESCO-IHE

WP 5.3 *Maximizing the use of natural systems in all aspects of the municipal water cycle*
- Discussion of potential research sites
- Presentation and discussion in LA
- UNESCO-IHE

Demonstrations

Demonstration foreseen:

At the moment two demonstration activities are foreseen in Beijing and one in Chongqing. They are:

- Improved rainwater harvesting and efficient irrigation in cooperative market oriented production in Huariou district, Beijing;
- Decentralised wastewater recycling and re-use for multifunctional agricultural enterprises in Chaoyang district, Beijing (to be decided dependant on the budget);
- Decentralised wastewater reclamation / ecosanitation and rain water harvesting in Chongqing';

1) Improvement and wider application of rainwater collection for urban agriculture in **Huarou district** linked to cooperative production of market oriented products (grapes, dragon-cactus**,** mushroom and agro-tourism based on the green agri-products and the pond **…..) .**

The emphasis in this research site at Huairu district will be on effective use of rain water in urban agriculture either by introducing new appropriate technologies for capturing water and its use (for instance drip irrigation), increasing its efficiency and also organisational and the financial feasibility for being copied or followed by others.

2) Improvement and wider application of re-use of waste-water for agriculture and other functions of a nature resourt in Xiedao (**Chaoyang district**)

Here, the development process and mechanism of the institute will be analysed, particularly its organisational and the financial feasibility for being copied or followed by others.

Training plans.

Training activity
Purpose
Target audience
Type of materials/delivery
Deliverable

Besides the LA activities listed above, some trainings are foreseen in both WP 5.2 and 4.1 for the respective research teams and working-group members:

- WP 5.2 Involve stakeholders/authorities: by offering training in stakeholder involvement, financing, planning, agriculture, etc. (certificate).
- Internal trainings for researchers on each specific topic
- Topics for more specialized training are expected such as:
    - Action research in urban agriculture and IUWM
    - Using the GIS tools for decision making and planning
- In addition the LA facilitator will seek support and training in LA by SWITCH (under WP 6.3).

Specifically for WP 5.2

- Multi-stakeholder Action Planning on Water for Urban Agriculture
- Training modules on action research, multi-stakeholder policy making, water management, urban agriculture
- IGSNRR with ETC

Dissemination activities

Dissemination activity
Purpose
Target audience
Deliverable

Dissemination

The following dissemination material will be developed in the first year period and actively disseminated in the next period.

- Develop and translate more materials in Chinese through various Learning Alliances activities and trainings;
- Develop and improve SWITCH website in English, with summaries of major activities and linking to relevant other Chinese and International websites on the subjects
- Participation to scientific meetings and workshops
- Dissemination of SWITCH issues by publishing/presenting scientific papers in Journals/workshops
- Dissemination of SWITCH by Ph.D. thesis
- Develop Scientific community and students network working on IUWM

Key Stakeholders for dissemination: :

- Decision-makers
- Technical staff of municipalities
- Scholars and students
- Public in general

. **Budget requests for LA activities** *including city coordinator, facilitation, city specific support activities.*

The budget is specified in additional budget needed for the first 18 Months, and for the total project period (estimated)

For details, please see the Financial planning in EU-Fin table. Partner code for IGSNRR is No. 13.

BELO HORIZONTE CITY

City Coordinator	LA Facilitator	Champion
Nilo Nascimento	Sônia Knauer	José Roberto Champs

The city and its water resources

Belo Horizonte (BH) is the capital of the State of Minas Gerais, which in economic terms (gross product) is the third among the 26 Brazilian states. The city lies at 20° South latitude and 44° West longitude (Figure 1) and has an altitude of 750 to 1,300 metres. It is located in a mountainous region of tropical soils that originated from the decomposition of metamorphic rock. Tropical highland weather predominates in this area, with an average yearly rainfall of 1,500 mm and an average yearly temperature of 21°C. The rainy season lasts from October to March, when 90% of the total yearly rainfall occurs. BH has 2,227,400 inhabitants with a population density of 6,900 inhabitants/km^2. It is a planned city, built in 1898 to become the capital of the state. The total area of the municipality is 330 km^2. The overall metropolitan area (RMBH; Belo Horizonte Metropolitan Area) consists of 33 distinct municipalities with an area of 9,179 km^2 and 3,900,000 inhabitants. Population growth in Belo Horizonte is virtually reaching a saturation level. Present average population growth rate is at 1.1 % per year (from 1990 to 2000) and a population of 3,000,000 inhabitants is expected for 2030. However, pressures on water resources due to population growth as well as a variety of environmental impacts due to rapid urban expansion may be consistently expected in the metropolitan region of Belo Horizonte (RMBH), where population growth rates higher than 5% per year are still observed in certain townships. Population projection for the RMBH is at about 8,000,000 of inhabitants in 20030.

The water supply system (dinking water) connects to 99.7% of Belo Horizonte residents with an average supply rate of 286 litres per inhabitant/day. The water supply system presents high standards in terms of operation as well as water quality. Surface sources predominate in the BH water supply system. There are four main sources, namely:

- Velhas (Velhas River Basin) with a capacity of 6.75 m^3/s;
- Manso (reservoir, maximum storage: 121,000,000 m^3) with a capacity of 4.2 m^3/s;
- Serra Azul (reservoir, maximum storage: 93,000,000 m^3) with a capacity of 2.6 m^3/s;
- Vargem das Flores (reservoir, maximum storage: 44,000,000 m^3) with a capacity of 1.2 m^3/s.

The total water supply production capacity is 16.3 m^3/s, however, present demand in the Metropolitan Region of Belo Horizonte is for 11,9 m^3/s. COPASA, the state company which has the concession for water supply and sanitation in Belo Horizonte, is currently increasing the capacity of Velhas system and duplicating the capacity of the Manso system.

In BH, about 92% of the population is connected to the wastewater sewerage system but there is a lack of wastewater treatment facilities and of interceptor pipelines, at the level of 50% of the required pipeline's length. There are two relatively recent wastewater treatment plants in operation, the Arrudas WWTP and the Onça WWTP, with a total capacity to treat 4.0 m^3/s. In the future, those WWTP will have their total treatment capacity increased to 8.1 m^3/s and will then be able to treat almost 100% of the total wastewater flow generated within the Arrudas and Onça catchments, including wastewater drained from the Contagem municipal area located upstream of both catchments.

Main water pressures and issues affecting Belo Horizonte

The following are some of the identified risks and pressures for the water domain in BH:

- Water supply:
  - Water quality degradation due to catchment environmental degradation, emergence of pathogen occurrences, accidental contamination or operational failures;
  - Flow reduction during dry seasons due to global change and local anthropogenic impacts on the hydrological regime;
  - Disruption of water supply systems due to natural hazards such as flooding, fires or landslides.
- Wastewater:
  - Persistent and chronic pollution of receiving water due to lack of investments to increase (wastewater treatment plants) WWTP treatment capacity and to implant interceptor pipelines;
  - WWTP not equipped to remove nutrients and emerging pollutants such as endocrine-disrupting chemicals;
  - Disruption of wastewater systems due to natural hazards like flooding or landslides.
- Stormwater:
  - Significant increases in the occurrence of floods due to different factors: increases in imperviousness, new developments in flood prone areas, climate change
  - Pollution of receiving waters by wet weather diffuse pollution;
  - Persistent and chronic pollution of receiving water due to different factors: no implementation of planned interceptors; persistence of illicit connections between stormwater and wastewater sewerage systems, lack of investments on wastewater treatment …

Risks associated to the use of best management practices (BMPs), e.g.: failures on flooding control and wet weather pollution abatement, lack of maintenance, insufficient technology update …

Explain how the LA was established

Stakeholder engagement strategy

So far, Learning Alliance activities have been mainly oriented to promote the participation of neighbourhood associations, schools, the participatory budget municipal committee, the climate change committee and the Lagoa do Nado municipal park team. Strategies of stakeholder engagement involved meetings to disseminate the main principals and purposes of the SWITCH project and to plan together SWITCH activities in Belo Horizonte; the publication of a newsletter about the SWITCH project in Belo Horizonte and the promotion of an open-air meeting (One day at the catchment) to promote a discussion on alternatives of combining leisure facilities to a existing detention pond.

From now on, a clear intention on involving other stakeholders to the BH LA is stated by PBH. The purpose is to enlarge the BH LA in order to count on the participation of all stakeholders listed as LA members as in the following item by March 2008.

UFMG and PBH-SUDECAP are having a meeting in 21st February 2008 aiming to prepare the invitations to be addressed to the new LA members as well as to prepare the first enlarged meeting of the BH LA.

With this enlarged LA, the LA plan prepared in 2006 will be discussed and some of the proposed strategies and work organisation will be considered for the functioning of the BH LA. This includes the creation of internal working groups in charge of developing particular subjects, documentation and organisation of workshops, organisation of technical tours to demonstration experiments and other activities.

LA Members:

- PBH – SUDECAP (SWITCH partner): PBH is the Belo Horizonte City Council and SUDECAP is the city urban water planning and management authority. The following PBH Secretaries are also involved in the SWITCH project:
    - Municipal Secretary of the Environment (SMAMA);
    - Municipal Secretary of Urban Policy (SMURBE);
    - Climate Changing Municipal Committee;
    - Lagoa do Nado Municipal Park.
- UFMG (SWITCH partner): The Federal University of Minas Gerais (Minas Gerais is one of the 26 Brazilian federated states). The following UFMG departments are involved in the SWITCH project:
    - Department of Hydraulics and Water Resources Engineering
    - Department of Sanitation and Environmental Engineering
    - Department of Geography
- COPASA: water and wastewater utility – Minas Gerais state owned company
- FEAM: the Minas Gerais EPA regulatory agency
- SEMAD: Ministry of Environment at the Minas Gerais state level
- Prefeitura de Contagem: Contagem City Council
- Prefeitura de Betim: Betim City Council
- Manuelzão Project: a UFMG programme concerned with public participation on environmental quality enhancement.
- Federal Ministry of Cities, represented at BH LA by the national Programme for the Modernisation of the Environmental Sanitation Sector (PMSS);
- Inhabitants of catchments where the DRENURBS and SWITCH project will develop activities.

LA member (Be sure to include SWITCH partners by name too)	Issues, goals and aspirations
We do not have this information per LA member, so far.	
A series of LA meetings is planned for 2008, starting in February. Issues, goals and aspirations of LA participants are subjects to be addressed during these meetings.	

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Learning Alliance members goals and aspirations

Overall LA objectives

General LA objectives in Belo Horizonte focus on meeting the SWITCH overall LA objectives, meaning:

- To support the implementation of research and demo activities, providing the mechanisms to link them within different themes and sub-themes of the SWITCH project (see the item “relationship to workpackages” in the forthcoming paragraphs);

- To promote and facilitate communication between LA members by regular and effective events able to capture and sustain the interest of LA members;
- To disseminate the results and issues of the SWITCH activities in Belo Horizonte through a website, publication of a periodic newsletter, organisation of meetings and workshops, participation to conferences and other meetings at the state and national levels, contributing to the scaling-up of research and demo activities and results;
- To monitor and assess the LA process in Belo Horizonte, focusing on the documentation of innovation processes and changes on IUWM based on an analytical approach that highlight the process by which changes are taking place.

Identification of main LA issues in Belo Horizonte

First activities of Learning Alliance in Belo Horizonte, involving mainly the SUDECAP and the UFMG teams, allowed to the identification of the following major problems on IUWM:

- Frequent flooding at different neighbourhoods with characteristics of flash floods.
- High pollution of receiving waters at the urban area and downstream (creeks, detention ponds, rivers) mainly due to:
    - Diffuse sources: typical urban diffuse pollution + solid waste and intensive erosion processes;
    - Interconnection among sewerage and storm water systems and lack of interceptor pipelines.
- Pollution problems of drinking water sources due to the upstream urbanisation, mining and agricultural activities at the Metropolitan scale (RMBH).
- Illegal occupation of risky areas mainly by low-income people – risk of flooding, landslide and heath risk due to poor sanitation conditions.
- High costs of structural measures in storm water management.
- Lack of integrated planning: urban development associated to sanitation and storm water management planning.
- Need of institutional development for enhancing decision making, budget planning and technology update (e.g.: knowledge on the system functioning, data collection and treatment, use of non-structural measures in storm water management).
- Need to develop inter-municipal cooperation.
- Need to increase public participation in decision making concerning UWM, including flood and diffuse pollution control, stream restoration in urban areas, scenic enhancement of landscape including water bodies ...

Research and demonstration activities have been conceived in order to deal with the identified problems at technical, institutional, social, economic and legal domains. Main topics presently pointed out are:

- Identification, adaptation and use of new technology and alternative innovative approaches to IUWM with focus on the use of BMPs in the storm water and wastewater domains.
- Identification and development of flood control alternatives in urban areas with focus on non-structural measures adapted to flash flood occurrences.
- Identification, use and evaluation of alternatives on modelling storm water systems.
- Development of indicators of sustainability on IUWM.
- Identification of ideal and achievable institutional frameworks, legal bases and financing models to deal with new approaches of IUWM taking into account current organisations, institutional actors and their mandates.
- Setting up links of SWITCH research, demonstration and training activities with other on-going programmes in Belo Horizonte and in Brazil, namely:
    - The Brazilian Continuous Education Programme in Water Supply and Sanitation, funded by the federal Ministries of Cities and of Research and Technology.

- PBH on-going programs: DRENURBS, Storm Water Master Plan, Sanitation Master Plan, Urban Water Committee

These specific objectives will be under discussion with the enlarged BH LA during the forthcoming meetings and workshops planned for 2008.

Achievements to Date

1. At the beginning of the DRENURBS programme, in 2004, a comprehensive review of publications on IUWM has been done. PBH SUDECAP is updating this review as part of the project focused on the development of a new IUWM model for the municipality;
2. A socio-environmental survey was done in 2007 aiming to assess the public acceptability of BMPs and their perception of the possibility of combining detention ponds with recreational areas. The survey was conducted by PBH and UFMG in the Vilarinho catchment, a neighbourhood where PBH is implementing one of the SWITCH demo in Belo Horizonte, including an artificial wetland.
3. At the end of the survey, an open-air meeting was organised by PBH and UFMG in order to present to the catchment inhabitants the main survey results, to promote a discussion on alternatives for improving the existing detention basin in this area as well as a general discussion on urban environment issues. The meeting, called "One day at the catchment" was attended by at about 500 participants.
4. Demonstration activities started, comprising:
    - Retro-fit of infiltration trenches in two catchments;
    - Rainfall harvesting applied in a high school involving environmental education as well;
    - DRENURBS river restoration programme started in three catchments;
    - Regular measurement of water quality in two catchments aiming to furnish data for designing artificial wetlands.
5. On-going research activities regarding the characterisation of hydrologic processes and water pollution on receiving waters, by measurement and modelling.
6. Hydrologic and hydraulic modelling of all the catchments located at the municipal area, aiming to evaluate the risk of flooding, flood risk zoning, and to diagnose the main causes of floods in the urban area. In-kind contribution of the municipality to the SWITCH project. Concluded.
7. Two LA workshops were organised in the context of WP 2, focusing on SUDS and integrated urban water management (workshop organised by Abertay University, UFMG and PBH) and innovation in stormwater management (workshop organised by Middlesex University, UFMG and PBH).
8. One workshop about the SWITCH project organised by Abertay University, Middlesex University and UFMG during the IWA 11th International Conference on Diffuse Pollution, in Belo Horizonte, in August;
9. Two versions for the Belo Horizonte SWITCH project poster were developed, one in Portuguese and the other in English;
10. The first edition of a regular SWITCH newsletter was issued, in Portuguese.
11. Evaluation of indicators currently employed by PBH/SUDECAP for water supply and sanitation planning and management. First developments of a wider base of indicators, including sustainability indicators started as a MSc research project. A study aiming to improve the indicator associated to urban drainage started. This study will integrate resent issues of the modeling project mentioned at point 6, above.
12. Performance evaluation of different urban drainage mathematical models. This research is part of am on-going PhD thesis started in 2007. Two catchments were selected and modeling has started.
13. Development of institutional mapping concluded at the municipal level. The project is focused now on the metropolitan, river basin, state and federal levels.

- Evaluation of indicators currently employed by PBH/SUDECAP for water supply and sanitation planning and management. Developments of a wider base of indicators, including sustainability indicators (WP 1.1).
- Evaluation of stormwater modelling results from the modelling program developed by PBH/SUDECAP. Comparative study of different stormwater models. Applying the SWITCH modelling approach for a selected catchment in the BH municipality (WP 1.2).
- Demonstration and research experiments on stormwater management, involving wetlands, detention basins and source control devices (WP 2.1 and 2.2).
- Development of institutional, governmental and social organisation maps (different levels: municipal, metropolitan, river basin, state, union), framework of stakeholder entitlements and obligations, assessment of institutional co-operation and communication tools (WP 6.1).
- Consolidate the BH Learning Alliance, develop the city website, edition of brochures and newsletters (WP 6.2).
- Offer two training workshops on integrated urban water management in cooperation with the Brazilian Continuous Education Programme on Water Supply and Sanitation (WP 0.2, WP 2.1 & 2.2; WP 6.1 & 6.2).
- Diffuse the Belo Horizonte SWITCH poster and create the BH SWITCH website for dissemination of SWITCH issues (WP 0.2; WP 6.2).
- Participation to one international event: 11th International Conference on Urban Drainage, in Edinburgh, UK, in September 2008 (WP 0.2; WP 2.1 & 2.2).
- Participation to one national meeting (Brazil): The national meeting on urban waters, in Rio de Janeiro, in May 2007 (WP 0.2, WP 1.1 & 1.2; WP 2.1 & 2.2; WP 6.1).

SWITCH Demonstration activities

1. Infiltration trench and detention systems: pilot studies to monitor water quality and quantity. Six experimental systems will be located at the UFMG campus in association with the demonstration devices installed as part of the Brazilian Continuous Education Programme on Water Supply and Sanitation. The systems will be fully controlled enabling the measurement of rainfall, inflow quantity and quality, water depth and quality within the system and outflow quantity and quality. The main water quality parameters to be measured are total suspended solids, biochemical oxygen demand and chemical oxygen demand, total nitrogen, organic nitrogen, ammonia nitrogen, nitrite and nitrate, total phosphorus, total hydrocarbons and the heavy metals zinc, copper, cadmium and lead. Following the first measurement programme, the list of water quality parameters monitored may be adjusted. In relation to the infiltration trenches, infiltration outflows will be estimated by balancing inflow quantity and water depth within the structure. Soil moisture will be continuously assessed (using tensiometers) and pollutant loading within the system and the adjacent soils determined at the end of the monitoring programme. In the Campus of UFMG works to build the experimental site started in February 2008;

2. Retro-fit infiltration trench: evaluation of the feasibility of retrofitting infiltration trenches in urban areas (in association with the DRENURBS project). This demonstration project aims to evaluate use of infiltration trenches on runoff water quality and quantity, as described above. However, in contrast to the above studies which are located in the relatively controlled environment of the UFMG campus, this system are located in an urban street and therefore an additional key aim is evaluate the feasibility of retrofitting a BMP within an urban

environment in relation to both social (diverse stakeholder interest) and technical (operation and maintenance) objectives.

3. Retrofit wetland and detention basins: assessment of the pollutant removal performance of retrofitted BMPs together with an evaluation of the social acceptability of locating water quantity and quality management systems within recreational areas. Rainfall, flow velocity and depth will be monitored at the inlet and outlet of each system to enable the hydraulic performance of each component to be quantified under various wet weather and dry weather conditions. Each system will be fitted with automatic water samplers at the inlet, mid-system and outlet to enable the continuous monitoring of wet weather events. Water quality during dry weather periods will also be assessed. As described above, the main water quality parameters of interest are total suspended solids, biochemical oxygen demand and chemical oxygen demand, total nitrogen, organic nitrogen, ammonia nitrogen, nitrite and nitrate, total phosphorus, total hydrocarbons and the heavy metals zinc, copper, cadmium, lead. The implementation of this monitoring programme will also enable the levels of diffuse pollution and contamination by wastewater and solid waste at a catchment scale to be assessed. Monitoring of both catchments started in May 2007.

4. Combined detention basin and creek restoration: an assessment of the impact of a detention basin in relation to runoff and pollution abatement together with an evaluation of the public perception of risk in urban areas (health risk, flooding risk) as well as public perception and acceptance of detention facilities. This project is located within Leitão creek catchment (surface area of 350 ha) in which is located the Santa Lúcia detention basin (SLDB). This detention basin began operating in 1953 with the main objective of controlling floods in the Belo Horizonte downtown area. However, as a result of the urbanisation of upstream areas in the 1970s, sediments, domestic sewage and garbage heavily impacted on the SLDB. Formerly an in-line structure, in the 1990s the SLDB was restored as an off-line system and was also equipped with now very popular leisure facilities. There is already a good level of neighbourhood social organisation within this catchment, and this fact, together with the combined use of the SLDB, opens up interesting opportunities to investigate public participation on decisions related to urban water management.

Another project concerns the river restoration DRENURBS programme. The DRENURBS programme is focused on creek restoration in Belo Horizonte, as a way to improve sanitation and environmental quality and by this doing to promote quality of life improvement. The program involves also the complete sanitation, risk management (risk of flooding, risk to public health …), erosion control at the catchment and river bed, and a housing programme addressed to people living in risky areas (improvement of housing conditions, removing people from risky areas).

The main DRENURBS actions under implementation are:

- Sewerage network and waste water treatment covering 100% of the inhabitants in the concerned catchments;
- Improvements on solid waste management services;
- Flood control and improvements on stormwater management;
- Erosion control at the catchment area and river bed;
- Development of new areas for cultural, leisure and social activities;
- Promotion of public participation on decision-making regarding urban water management.
- Educational activities leading to the improvement of public participation on decision-making on urban water management.

Linkages of SWITCH with other regional/city water initiatives

- The Brazilian Continuous Education Programme on Environmental Sanitation, a training programme funded by the federal Ministries of Cities and of Science and Technology. This programme is focused in offering training courses on water supply and sanitation addressed to professionals acting in the urban waters area. In the state of Minas Gerais, at about 24 courses will be organised in 2008, in Belo Horizonte and other municipalities. UFMG is the leading university of this programme in the Brazilian southeast region, comprising the states of Minas Gerais, São Paulo, Rio de Janeiro and Espírito Santo. As previously mentioned, UFMG teams involved in this programme and in SWITCH are working on the association of both projects.
- The Brazilian Ministry of Science and Technology launched in 2006 a 2-year research programme on integrated urban water management. A research network of 6 universities has been stated to develop research activities in this domain in the cities of Belo Horizonte, Brasília, Porto Alegre, Santo André, Recife, and Natal. UFMG, which is one of the universities participating to this network, has associated research activities to be carried out in this programme with those of SWITCH in BH.
- The municipalities of Betim, Contagem, Sabará and Santa Luzia, which have been contacted to participate to the BH Learning Alliance are invited to develop in their territory demo activities similar to those in BH. SWITCH teams in BH can offer expertise on demo conception and implementation.
- Climate Changing Municipal Committee: This municipal committee aims at identifying potential impacts of climate change and ways of dealing with those impacts. The SWITCH team in Belo Horizonte participate regularly to the meetings of this committee with the purpose of contributing to the discussions, programmes and other activities in the domain of climate change.

Activities for Months 13-30 and planned activities from Months 25-42

Summary of the main points/focus of SWITCH activities in Months 13-30

1. At the beginning of the DRENURBS programme, in 2004, a comprehensive review of publications on IUWM has been done. PBH SUDECAP is updating this review as part of the project focused on the development of a new IUWM model for the municipality;
2. A socio-environmental survey was done in 2007 aiming to assess the public acceptability of BMPs and their perception of the possibility of combining detention ponds with recreational areas. The survey was conducted by PBH and UFMG in the Vilarinho catchment, a neighbourhood where PBH is implementing one of the SWITCH demo in Belo Horizonte, including an artificial wetland.
3. At the end of the survey, an open-air meeting was organised by PBH and UFMG in order to present to the catchment inhabitants the main survey results, to promote a discussion on alternatives for improving the existing detention basin in this area as well as a general discussion on urban environment issues. The meeting, called “One day at the catchment” was attended by at about 500 participants.
4. Demonstration activities started, comprising:
    - Retro-fit of infiltration trenches in two catchments;
    - Rainfall harvesting applied in a high school involving environmental education as well;
    - DRENURBS river restoration programme started in three catchments;
    - Regular measurement of water quality in two catchments aiming to furnish data for designing artificial wetlands.
5. On-going research activities regarding the characterisation of hydrologic processes and water pollution on receiving waters, by measurement and modelling.
6. Hydrologic and hydraulic modelling of all the catchments located at the municipal area, aiming to evaluate the risk of flooding, flood risk zoning, and to diagnose the

main causes of floods in the urban area. In-kind contribution of the municipality to the SWITCH project. Concluded.
7. The LA facilitator, Sônia Knauer, participate to the three LA training courses promoted in 2007 (Cairo, Lodz and Accra);
8. Two LA workshops were organised in the context of WP 2, focusing on SUDS and integrated urban water management (workshop organised by Abertay University, UFMG and PBH) and innovation in stormwater management (workshop organised by Middlesex University, UFMG and PBH).
9. One workshop about the SWITCH project organised during the 11th International Conference on Diffuse Pollution, in Belo Horizonte, in August;
10. Scientific papers presented in the 11th International Conference on Diffuse Pollution, in Belo Horizonte (August); the 6th NOVATECH conference, in Lyon (June);
11. The BH SWITCH team presented 4 papers at the 2nd SWITCH Scientific Meeting, in Tel Aviv (November);
12. Two versions for the Belo Horizonte SWITCH project poster were developed, one in Portuguese and the other in English;
13. The first edition of a regular SWITCH newsletter was issued, in Portuguese.
14. Evaluation of indicators currently employed by PBH/SUDECAP for water supply and sanitation planning and management. First developments of a wider base of indicators, including sustainability indicators started as a MSc research project. A study aiming to improve the indicator associated to urban drainage started. This study will integrate resent issues of the modeling project mentioned at point 6, above.
15. Performance evaluation of different urban drainage mathematical models. This research is part of am on-going PhD thesis started in 2007. Two catchments were selected and modeling has started.
16. Development of institutional mapping concluded at the municipal level. The project is focused now on the metropolitan, river basin, state and federal levels.

Summary of the main points/focus of SWITCH activities in Months 25-42

1. Evaluation of indicators currently employed by PBH/SUDECAP for water supply and sanitation planning and management. First developments of a wider base of indicators, including sustainability indicators.
2. Evaluation of stormwater modelling issues from the modelling program developed by PBH/SUDECAP. Start the SWITCH modelling approach for a selected catchment in the BH municipality.
3. Continuity of the planned experiments and demonstrations on stormwater management, involving experiments on wetlands, detention basins and source control devices.
4. Inclusion of other experiments involving the use of infiltration trenches, reuse of water and rainfall harvesting at the Lagoa do Nado Municipal Park.
5. Continuity of the development of institutional, governmental and social organisation maps, including the metropolitan, river basin, state and federal levels. This will include the construction of a framework of stakeholder entitlements and obligations, the assessment of stakeholder communication tools and institutional co-operation.
6. Conclusion of the stakeholder analysis on the bases of issues obtained during a LA meeting focused on this activity.
7. Consolidate the BH Learning Alliance by different activities and initiatives as follows:
    - Enlargement of the LA members, involving stakeholders of different domains and sectors (see the list of LA members on page 3);
    - Promotion of workshops, meetings and field visits focusing on participatory and research and demo implementation and evaluation;
    - The dissemination of SWITCH activities and issues, through the BH website, the publication of a regular newsletter, participation to conferences, workshops and other meetings.

8. LA process documentation including reports of LA meetings, workshops andfield visits.
9. Offer of two training workshops on integrated urban water management in cooperation with the Brazilian Continuous Education Programme on Environmental Sanitation. This activity was postponed from 2007 to 2008 following decisions taken by the co-ordination of the Brazilian Continuous Education Programme on Environmental Sanitation.
10. Diffuse the Belo Horizonte SWITCH poster and create the BH SWITCH website for dissemination of SWITCH issues (WP 0.2).
11. Participation to one international event: the IWA-IAHR 11th International Conference on Urban Drainage, in Edinburgh, UK, in September 2008.
12. Participation to one national meeting (Brazil): The national meeting on urban waters, in Rio de Janeiro, in May 2007. This meeting is organised by the Brazilian Association of Water Resources (ABRH).

Activities to Month 42

Learning Alliance

Activity	Specific objective	Task	Deliverables	Due Date
Training of the LA facilitator	Advanced LA training addressed to Latin America LA facilitators	Participation to the facilitator training workshop	LA facilitator trained	May 2008
Training of the LA facilitator	Workshop aiming to promote learning and sharing experiences on LA activities	Participation to the facilitator training workshop	LA facilitator trained	Possibly associated to the SWITCH 3rd Scientific Meeting
PBH and UFMG meeting to prepare the second LA general meeting	To prepare the second LA meeting focusing on visioning and scenarios for an IUWM plan	Preparation of the meeting Contact Zoran Vojinovic to conclude the workshop meeting	Workshop planned	PBH and UFMG meeting in 21st February. Meeting prepared by 29th February 2008.
LA enlargement – invitation to other stakeholders to become LA members	Complete the stakeholder representation in LA	Contact stakeholders	Enlarged composition of the LA	Invitations concluded by 15th March 2008
Second LA meeting: workshop on WPs' plans (March 2008)	Discussion, update and validation of the LA action plan and constitution of thematic working groups.	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation + meeting documentation.	31 March 2008.
Third LA meeting – workshop on visioning and scenario planning for IUWM	To develop a visioning on IUWM in the future for the city of Belo Horizonte.	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation + meeting documentation	April 2008 – date to be confirmed with IHE team
Interviewing stakeholders on decision making for urban stromwater management,	This objective fulfil WP 2.2 task on identifying modes of communication with colleagues in other water sectors/the public; tensions, blockages; knowledge and skills requirements	Interviewing stakeholders	Report on the subject	May 2008

Fourth LA meeting: workshop on stakeholder analysis	To develop the stakeholder analysis, according to SWITCH guidelines.	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation + meeting documentation	May or June 2008, data to be confirmed
Fifth LA meeting: workshop on stormwater BMP experiments (August 2008)	Evaluation of first experimental results. Visit to the experiment and demo sites	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation and documentation plus visit to the sites.	August 2008.
Sixth LA meeting: workshop about WPs 1.1, 2.2 and 6.1.	Evaluation of progress done on WP 1.1, 2.2 and 6.1 – May be coincident with the 3rd SWITCH Scientific Meeting, if Belo Horizone is chosen to held this conference	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation.	December 2008
Seventh LA meeting – workshop about WP 1.2 progress	Evaluation of progress done on WP 1.2 – modelling	Preparation of the meeting. Meeting realisation. Report of the meeting.	Meeting realisation	March 2009
Conference on IUWM	Address main issues related to IUWM. The conference will be open to the participation of researchers and practitioners at the Brazilian national sphere.	Preparation of the conference. Conference realisation. Publication of the conference proceedings	Conference realisation and publication of proceedings	August 2009.
Publication of the Belo Horizonte SWITCH Newsletter	Aiming at the dissemination of SWITCH demo and research activities in Belo Horizonte	Preparation, edition and distribution of the Newsletter	Three Newsletters issues published per year	First issue published in February 2008. Forthcoming issues in 06 and 12/2008
Belo Horizonte SWITCH website	Aiming at the dissemination of SWITCH demo and research activities in Belo Horizonte and to facilitate communication between LA members	Development of the Belo Horizonte SWITCH website	Belo Horizonte SWITCH website operational	Depends on a tender organised by SUDECAP to the development of the website.

Training

Training activity	Purpose	Target audience
Workshop on integrated urban water planning. - in co-operation with the Brazilian Brazilian Continuous Education Progr. on Environmental Sanitation	Assessing the experience of the audience on planning activities. Developing the concept of IUWM Training of tools for IUW planning.	Technical staff of municipalities. Urban planners and architects. Stakeholders and decision-makers acting in the urban context
SWITCH stormwater Online In co-operation with Abertay University	Provide the students with an overview on sustainable drainage systems, treatment train, source and site control, stormwater design methods, treatment performance, stormwater re-use and strategic stormwater planning.	Members of the Learning Alliances from all demonstration cities, municipal officers, drainage engineers, policy-makers, urban planners and designers, water industry, environmental regulators and property developers.
Workshop on stormwater BMPs.	Assessing the experience of the audience on decision-making for urban stormwater management. Disseminate technological alternatives in the stormwater domain. Training on decision-making for effective urban stormwater management. Training on the design of BMPs.	Technical staff of municipalities. Urban planners and architects

Dissemination

Dissemination activity	Purpose	Target audience
Participation to scientific meetings (1 international and 1 national conference in 2008)	Dissemination of SWITCH issues by scientific papers	Scientific community and students working on IUWM
BH city website	Dissemination of SWITCH activities in BH and Brazil	Stakeholders, decision-makers, technical staff of municipalities, scholars and students Public in general
Brochures and newsletters about SWITCH activities in BH	Dissemination of SWITCH activities in BH and Brazil	Stakeholders, decision-makers, technical staff of municipalities, scholars and students Public in general
Conference on IUWM	Address main issues related to IUWM. The conference will be open to the participation of researchers and practitioners at the Brazilian national sphere.	Stakeholders, decision-makers, technical staff of municipalities, scholars and students Public in general

Budget summary – Workpackage 6.2: Learning Alliance Activities

Year	Funds Available (total)	Funds Used (total)	Staff costs	LA meeting/ event costs	Local costs & other expenses	LA training costs (travel and expenses for participation)	Total Funds Remaining / Required (EUR)	
2006								•
2007	90600.00	27497.69			14415.55	13083.14	63102.31	• LA LA
2008	76800.00		30000,00	3000.00	39800.00	4000.00	0	• Pu de • LA
2009	125647.38		35206.15	3000.00	63441.23	4000.00	0	- F co
2010	56647.38		35206.15	3000.00	14441.23	4000.00	0	- F co pla
2011								-

Explanations: (i) Budget includes EU funds plus SUDECAP in-kind funds; (ii) Figures include budget for research and demo activities under WP 6.2; (iii) 'Local and other expenses' column includes indirect costs on the base of 20% of direct costs; (iv) Funds available in 2007 are the budget for the inception phase of SWITCH (first 18 months) as planned in 2005.

Training and support needs:

Annual workshops on learning and sharing experiences on LA activities
Newsletter and website;
Banners, photos and video;
Courses about the themes;
Monthly meetings with the LA members - a good structure for meetings is key;
Exchange visits

Longer Term LA Sustainability

How can learning alliance activities be sustained in the city in the medium to long term? Have any local sources of LA funding or in-kind support been identified?

The Belo Horizonte municipality counts on an institutionalised participatory framework aiming to decision-making and to the social control of public policies, including the water sector, as for instance, the Municipal Sanitation Council (COMUSA), the Municipal Urban Policies Council (COMPUR) and the Municipal Environmental Council (COMAM). Therefore, one of the questions regarding the continuity of the BH LA after SWITCH points out to the relations the BH LA will establish with these existing participatory organisations and on the identification of complementarities on objectives and actions.

Considering that the BH LA is being constituted, in its enlarged form, at the beginning of 2008, questions related to its sustainability in medium to long term will be addressed in the forthcoming months.

The city report of Cali, Colombia
January 2008

Coordinator	Facilitators
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This report provides an overview of the progress made in the SWITCH programme in Cali and sets out the activities for 2008 onwards. It is important to indicate upfront that in line with the discussions with SWITCH management the position of Cali is changing from a case study to a demonstration city and that a learning alliance is emerging to strengthen institutional collaboration. This is a very good development which implies that Cali being part of work packages (WP) 1.1 and 5.3 now also becomes part of WP 6.2 and there also seems scope for activities under WP 6.1 and 6.4. These developments are very valuable for Cali as well as for the SWITCH project, but have some budget implications that are outlined in the financial section.

The city and its water resources

Cali is the capital of Valle del Cauca and the third city of Colombia with a population of 2´075.380 inhabitants (DANE, 2005). It is the principal city basin of the Pacific Ocean and the main administrative center of the southwestern region of the country. The city has a consolidated urban area and an expansion zone towards the south. In this area new housing projects of housing are being developed at present for different socio-economic levels.

Cali has seven rivers, four of which are used for drinking water supply for the city. The public services are provided by EMCALI. Water supply coverage amounts to some 97 % and is provided through two networks. One network operates under gravity supply whereas the other needs pumping. There are five drinking water treatment plants, with the Cauca River being the principal source that supplies approximately 76 % of the city. Two other important plants use water from the Cali and Meléndez rivers; these plants however face water shortages in some months of the year.

The sewerage coverage is 94.8 %, and is divided in three independent systems or zones: South, North-western and East. Part of the wastewater is treated in the Cañaveralejo wastewater treatment plant. This plant initiated operations in the second semester of the year 2001. Another part of the wastewater is discharged directly into the Cauca river. This comes from different pumping stations but mainly through the South Channel, which is a big drainage channel that flow into Cauca River up-stream from the water intake of the main Dinking Water Plant for the city in Puerto Mallarino. This Channel also receives the leakage from the ‘sanitary´ landfill of Navarro. Peak pollution from this channel after rains poses important problems for drinking water treatment as the intake of the treatment plant is downstream of the outlet of this Channel.

Cali produces 1800 Tons/day of solid wastes. EMSIRVA is the public service enterprise in charge of recollection and disposal of this waste in the Navarro

landfill. The disposal of the solid wastes is not very sanitary and after of 30 years of service the Navarro landfill is full. The city administration is now urgently looking for alternative solutions. Uncontrolled disposal of solid waste poses important drainage problems in the city.

Main water issues affecting Cali

A workshop was organized in 2007 to review the situation in Cali and to encourage the development of a Learning Alliance to foster institutional collaboration and enhance the impact of research activities on policy developments. The participants in this workshop identified different water issues and water related issues that pose a problem in the city of Cali:

- Lack of an integrated vision and short term planning
- The river basin is not studied as a whole
- Limited inter-institutional coordination
- Limited community participation
- Lack of leadership
- Resilience to new concepts in development change
- Limited technological focused on non sustainable end of pipe solutions not taking into account for example key developments such as cleaner production
- Problems related to the management of information
  - ✓ Information not reliable
  - ✓ Information not related to decision making process
  - ✓ Lack of environmental information (not exact , restricted and kept secretly)
  - ✓ Lack of institutional set up
- Sometimes decision making is made based on own interests
- Lack of capacity building and limited environmental education at all levels)
- Limited monitoring and control actions

Looking at the overall problems three main problem areas have been identified by the participants:

a) The water quality problems of Cauca River and its impact on drinking water supply. This is a complex problem as it is influenced by rainfall, the waste water disposal of the city of Cali, drainage water of the Navarro landfill and the discharge regime of the main dam in the river.
b) The planned expansion of Cali towards the south (Corredor Cali – Jamundí), which offers a unique opportunity to establish new (innovative) infrastructure including water supply, sanitation and urban drainage.
c) The urban drainage and waste water problems in the Southern part of Cali which have an impact on the city as a whole.

For each of these problems an overview was provided of the problem situation, key stakeholders were identified and current activities and projects related to these problems were listed. Both reports will be reviewed by stakeholders and completed early next year.

The available information provides a very good basis for the stakeholders involved to build learning alliances around these three problem areas. This will be a key element of the activities in 2008. It is important to note that the work on the LA in Cali benefits from the work that is being undertaken as part of Cali being a case study. On the other hand the case study benefits from the institutional contacts that have been established as a result of the preliminary LA meetings

SWITCH in the City – Existing relationship to Work packages

Cali has been involved in 2 topics of SWITCH,

- WP 1.1, the Development of a Strategic Approach and of Indicators for Sustainability and Risk Assessment and
- WP 5.3, Maximizing the Use of Natural Systems in all Aspects of the Municipal Water Cycle.

The focus of the activities in these two packages is of a much more technical nature Gradually however the staff and advisors involved in the activities agreed that the institutional dimension and the need to strengthen information sharing are of great importance to jointly address these technical issues and enhance their chance of successful application in Cali. For this reason some support was already provided through the IRC under WP 6.2 to encourage the development of a learning alliance to enhance the impact of activities in the other WPs, to help foster institutional collaboration and to stimulate the development of new projects together with the different institutions.

Summary of main activities of Cali as a case-study (Months 12-23)

Under WP 1.1 *The Development of a Strategic Approach and of Indicators for Sustainability and Risk Assessment, the* following main activities were implemented:

- A report was prepared with a description of the concepts and policies followed for urban water management in Cali by EMCALI and other institutions: CVC, DAGMA, EMSIRVA, etc (Activity 1b)

- Diagnosis of urban water management of Cali, in the context of the conceptual framework. This diagnosis includes. General characteristics of Cali, water resources, drinking water supply, sewerage system, waste water pollution control, solid waste management, future urban expansion areas and institutional framework (Activity 1d)

- 3 workshops were held in 2007, including one with a broader group of participants in the context of the regional conference Latinosan2007 (Activity 1.e)

Under *WP 5.3, Maximizing the Use of Natural Systems in all Aspects of the Municipal Water Cycle* a number of activities were carried out with results also benefiting from the activities under WP 1.1. The main activities were:

- The implementation of individual meetings with key stakeholder organizations and diagnosis of urban water management of Cali, which included the compilation, organization and processing of information.

- A literature survey was carried out and operational data were reviewed concerning existing technologies (Natural systems): Anaerobic ponds; facultative ponds; maturation ponds; macrophyte system (type duckweed); anaerobic filter and UASB reactor.

- PhD study of Alberto Galvis on technology selection, which includes a number of issues related to the situation in Cali. This study concerns the development of a comprehensive model for technology selection to prevent and control the impact of waste water in a water catchment area. This model is very useful for the development of the expansion of the Southern part of the city of Cali and progress is being made with data collection concerning the existing situation. The first ideas where reviewed by Damir Brdjanovic y Diederik Russeau a Cali in February 2007. A case study was developed for technology selection in Buga, a city with 100,000 inhabitants in the same catchment area as Cali and presented in the *Second Switch Scientific Meeting in Tel Aviv, in November, 2007.*

- PhD study of Juan Pablo Silva. This study concerns the evaluation of greenhouse gas emissions from eco-technologies. This is also an interesting subject for the waste water problems in Cali as it embarks on an area that presently is not being considered but is relevant in the context of global warming. The proposal for the study was developed during a five months stay in Delft and data collection will now be initiated.

- Visits were made by staff from UNESCO – IHE. First visit in February of 2007 (Damir Brdjanovic; Diederik Russeau) to look at the waste water and drainage situation of Cali and Buga, get acquainted with some of the SWITCH partners and discuss progress with the two PhD candidates. They gave presentations on SWITCH related issues (*Technologies for Waste water treatment by* Brdjanovic *and Possibilities to incorporate ecotechnologies in urban water cycle" by Russeau),* which were attended by staff from different SWITCH partners. Second visit in November by Damir Brdjanovic and Diederik Russeau, to give SWITCH related presentations in the Latinosan conference and discuss with members of the emerging SWITCH Learning Alliance, particularly stressing the need for a paradigm shift. Ioana Popescu and Carlos Velez also participated in this visit under the umbrella of another UNESCO-IHE project that deals with data collection and has links with some of the SWITCH partners in Cali. This is a good example of combining efforts in support of the development of the city of Cali that very well fits the concept of a learning alliance.

- Jan Teun Visscher of the IRC LA team made three short support visits to facilitate the development of the Learning Alliance. These visits included co-facilitation of meetings, some training of staff and some presentations on Learning Alliances that were attended by staff from SWITCH partners.

The development of the Learning Alliance (Months 12-23)

The SWITCH learning alliance in Cali is off to a good start although it had no direct financial support from the project in 2007. The LA was able to build on earlier experience and existing information available in different institutions. It benefited from a close link with the COLCIENCIAS funded integrated water resources management (IWRM) project for Valle del Cauca region of which Cali is the capital. The Spanish name of this project is Gestión Integral de Recursos Hídricos (GIRH). The emerging LA also received support from IRC to facilitate its development.

The LA team is led by staff from the institute CINARA of the UNIVALLE. The city coordinator is Alberto Galvis and facilitation in 2007 was done by different persons from the CINARA team. During the year they had external support from Jan Teun Visscher on behalf of IRC.

For 2007 no budget was available from SWITCH for the partners in Cali for the alliance which implies that funding for activities had to be found elsewhere. This has hampered progress particularly because of the lack of a city facilitator with sufficient time to connect and build rapport among the institutions. Nevertheless good progress has been made with the stakeholder analysis and the situation description using among others resources from the case study budget. It is important that the situation will change however as Cali has a great potential as a demonstration city as key actors are determined to tackle a number of pressing problems.

There is a growing understanding of the need for a Learning Alliance, as many agree that inter institutional collaboration needs to be strengthened. The first meetings did not yet establish a formal objective for the alliance, but a list of suggestions from participants why a learning alliance would be useful was already obtained. This list will be an input for the next meeting were visioning will be an important issue. That meeting will also be used to establish the rules of engagement more clearly.

Process documentation is gradually taking shape, with an initial focus on the existing situation. With the proposed nomination of dedicated staff for the SWITCH LA it will however be possible to strengthen process monitoring and documentation. A distinction will be made between the 'content' related problems which have received most attention so far and difficulties related to the inter-institutional collaboration.

Overall LA objectives

The overall objective of the LA is to jointly develop a vision for the future for IWRM in Cali and ensure that research activities truly support the required innovation to improve IWRM. To that extend activities are being planned under the three main headings of the LA

- *Coordinating action research*. The current activities of the LA already relate to research activities including for example the activities of the GIRH project

and the activities that are developed on waste water treatment of the SWITCH project. The LA meetings have been used to also inform participants of these projects. If the LA team is strengthened in 2008 a more structured approach can be taken identifying the most interesting learning and demonstration opportunities based on the further development of the three problem areas.

- *Monitoring and evaluation/ process documentation*. This is an important aspect that is very much needed in Cali. Documentation is now mainly focused on project outputs but does not say much about development processes nor about policy and longer term implications. Having a stronger LA team will also allow to better support these aspects.
- *City level communication* So far the emphasis has been on personal communication with key institutions and the three main workshops that were held. In these meetings it was clearly established that communication needs to be strengthened. This provides a good basis to launch a City website with clear links to the websites of existing institutions. Also a newsletter may be used to strengthen communication and information sharing. In 2007 it was not possible to visit other demonstration cities, but in the proposed LA budget for 2008 some resources have been included to make this possible.

Summary of main activities of the emerging Learning Alliance (Months 12-23)

The main activities that have been carried out in 2007 include

- Several individual meetings with staff from leading organizations in Cali.
- Three major workshops with different stakeholders on respectively April 13, October 4 and November 16. From these meetings key members of the LA are emerging (Table 1)
- A stakeholder analysis report was drafted
- A workshop report was produced on three important problem areas with great potential for LA activities and new projects

Links to SWITCH Demonstration activities

Different demonstration activities can be established in the City of Cali because a lot of pressure exists to solve some of the IWRM problems. The initial meetings of the LA have already raised interest among participants to do things differently and several opportunities exist that can be developed into demonstration or better said learning projects. In the course of 2008 it will become clear which opportunities will be most pressing and attractive.

Table 1. Key members of the Learning Alliance and their role at local level

LA member	Issues, goals and aspirations
Municipality	It promotes, finances, and co-finances public service infrastructure projects e.g. flood prevention, river decontamination, technical assistance, protection of the environment, adequate use of water bodies, and social participation decision making on service delivery.
Regional Corporation of the Valle del Cauca (CVC)	It exerts the authority at the environmental level; it promotes environmental sustainable development throughout the region and in the

	national environmental network (SINA).
Cali Municipal Enterprise, EMCALI	It contributes to the well-being and development of the community guaranteeing the delivery of essential public services.
Solid waste municipal company, EMSIRVA.	Their mission is to guarantee an optimal integrated management of solid waste, ensuring a) social and economic benefits for the community, b) permanent organizational development of the company, c) educational campaigns in favor of the protection of the environment and d) continual improvement in the quality of the service and relations with the users.
Administrative department for the management of the environment. DAGMA	This department is only present when the population in the community is higher than 1'000,000 inhabitants. Its mission is to strive for the sustainable development of the environment inside the legal framework and policies set by the Ministry for the environment.
Municipal Public Heath Secretary	It aims to improve quality of life of the community ensuring an optimal level of health. It guarantees the environmental sustainability in order to reach a good socio-economical level in the community. It also implements prevention policies when the environment and the community are at risk.
CINARA - UNIVALLE	CINARA-UNIVALLE is coordinating the activities of the LA. Alberto Galvis is the city coordinator of the LA and Diana Paola Bernal and Diana Amparo Cardona are the proposed city facilitators. Ines Restrepo is another key member of the team and the leader of the IWRM project for Valle del Cauca that is supported by COLCIENCIAS. The CINARA-UNIVALLE team will also guide the development of the communication strategy and the website
EIDENAR-UNIVALLE	Juan P. Silva, PhD about evaluation of greenhouse gas emissions from eco-technologies.
UNESCO-IHE	Provides support to the activities under WP 1.1 coordinated by Peter van der Steen and 5.3 coordinated by Diederik Russeau with main inputs from Damir Brdjanovic. Huub Gijzen is the director of the tesis of Alberto Galvis and Juan Pablo Silva and Peter van der Steen and Henk Lubberding are the respective mentors.
IRC	Is providing support to the development of the Learning Alliance mainly through the involvement of Jan Teun Visscher, John Butterworth and Stef Smits.

Planned activities of Cali under WP 1.1 and 5.3 (Months 24 -42)

The activities on the two work packages will proceed as indicated below. For each of them more detailed plans will be developed in the coming period.

WP 1.1:

- Application of AquaCycle-plus model to Cali (activity 2b);
- Cali Case - new development in the south of Cali. Evaluate how different strategies (conventional approach, SWITCH approach and maybe others) would affect the sustainability of the urban water system in that new area (Activity 2c)

WP 5.3:

- Evaluation of greenhouse gas emissions from eco-technologies (PhD J.P. Silva).
- Development of a technology selection model to enhance pollution prevention and improve control for municipality waste water in the context of the basin (PhD A. Galvis)
- Development of a conceptual framework for the city of Cali, Colombia (Study area), which maximizes the use of natural systems for wastewater treatment and reuse.

Planned activities under WP 6.2 (Months 24-35)

The planned activities for the LA are outlined for the period till July 2009. During this period it will become clear how strengthening the team and enhancing the LA activities will help improve demonstration, learning and institutional collaboration and what level of support is needed for the remaining project period and what support can be generated locally.

The details and results of the planned activities for WP 6.2 for months 24-42, subject to available funding, are presented in Tables 2.1, 2.2 and 2.3. The main activities include the following:

1. Strengthening of the LA team by nominating two part-time facilitators, some research associates and the involvement of a person with experience in web based communication
2. Establishment of a City Website for the LA with active links to the Websites of the different key actors
3. Developing two articles on the experience with the LA and on the developments in at least one of the problem areas (process documentation)
4. Fine-tuning and disseminating the report on the stakeholder analysis
5. Further development of the analysis and proposals for possible interventions for the three main problem areas that have been identified and that will be the basis for developing three LA working groups
6. Organizing an IRC co-facilitated visioning exercise with the main stakeholders in 2008 and a follow-up review meeting in 2009 to consolidate the vision and introduce improved planning methods
7. Organizing an IRC co-facilitated training workshop on conflict mediation to identify and review specific problems in the three main problem areas that were selected, and a review meeting in 2009
8. Two visits to one of the other SWITCH cities
9. It also will be explored if the envisaged IRC led LA training workshop in Spanish for Cali, Lima and Zaragoza can be held in Cali

Table 2.1 General Planning against LA Deliverables (months 24-35)

Activity	Specific objective	Task	Deliverable	Deliverable Due Date
Invite a few additional organizations to the LA meetings	Strengthen the emerging LA.	Facilitation Reporting	Expanded stakeholder analysis	February 2008 April 2008
LA Meeting 1	Visioning exercise.	Facilitation	Report on workshop	Feb/March 2008
LA Meeting 2	Development problem areas	Facilitation.	Report on meeting and on problem areas	April/May 2008
LA Meeting 3	Discuss progress	Facilitation.	Report on meeting	Aug/Sept 2008
LA Meeting 4	Discuss progress	Facilitation.	Report on meeting	Nov 2008
LA Meeting 5	Discuss progress	Facilitation.	Report on meeting	Feb/March 2009
LA Meeting 6	Discuss progress	Facilitation.	Report on meeting	April/May 2009
Quarterly reports	Reporting	Writing	Progress reports	Quarterly
Process documentation	Create access to knowledge and	Facilitation Writing and	Documented cases	Nov 2008

	experience	editing		
Identification of demonstration (learning) opportunities	Strengthen the scope as demonstration city	Proposal development	Project proposals	Sept 2008
Review meeting of progress and results of process documentation and demonstrations	Review impact of documenting knowledge and experience and demonstration	Facilitation participatory evaluation	Review report	April/May 2009

Table 2.2 Training (Months 24-35)

Training activity	Purpose	Target audience	Type of materials / delivery	Deliverable Due Date
Visioning (1)	To establish a team of co-facilitators in CINARA-UNIVALLE	CINARA-UNIVALLE staff and staff from other SWITCH partners	Course overview Course notes and presentation materials	Feb/March 2008
Visioning (2)	To implement a visioning workshop for each of the three problem areas	SWITCH partners	Reports on the visioning for each of the three problem areas	Feb/March 2008
Mediation (1)	To establish a team of co-mediators in CINARA-UNIVALLE	CINARA - UNIVALLE staff and staff from other SWITCH partners	Course notes	Aug/Sept 2008
Mediation (2)	To explore possible conflicts and develop possible solutions	SWITCH partners	Overview of a number of conflicts and possible solutions	Aug/Sept 2008
Visioning (3)	To revisit and reassess and adjust the results of the visioning workshop	SWITCH partners	Reports on the review of the visioning for each of the three problem areas	Feb/March 2009
Mediation (3)	To revisit results of possible solutions	SWITCH partners	Report including a review and assessment of mediation impact	May 2009

Table 2.3 Dissemination and information sharing (Months 24-35)

Dissemination activity	Purpose	Target audience	Deliverable Due Date
Two articles in Electronic news letter SOURCE managed by CINARA-UNIVALLE	Communications within and outside Cali LA	Cali LA Sector staff in Colombia and in Latin America	May 2008, February 2009
Web site	Promoting SWITCH Disseminating LA products	National and international audience	Aug 2008
Preparation article	Document and share information on LA process	National and international audience	October 2008
Visits to two other SWITCH cities	Information sharing Broadening of horizon of staff	Cali LA core staff	To be decided
Participation in the city sharing meeting	Information sharing among cities	City coordinators and key researchers	To be decided

Requested additional budget for activities in WP 6.2 (Months 24-42)

To implement the envisaged activities under 6.2 additional funding is needed. The requirements for the Univalle team for weeks 24-42 are indicated in table 3. In Table 4 a first estimate is given for the cost for the period including 2011. This overview does not include the support from the IRC team. IRC has already

indicated that they can and are willing to accommodate their support activities in their available budget.

Table 3 Additional budget for activities in WP 6.2 (Months 24-42)

Items	EUROS
Staff Cost	
City facilitators	10,500
Research associates	4,500
Web site manager	4,500
Travel (3 trips)	7,500
Meetings	8,000
Documents	7,000
Unforeseen	1,000
TOTAL	43.000

Table 4 Overview of budget requirements for activities in WP 6.2

Yr	Funds requested (total)	Funds Used (total)	Staff costs	LA meeting/ event costs	Local costs & other expenses	LA training costs (travel & participation)
06	0					
07	0					
08	30000		13000	6000	6000	5,000
09	25000		13000	5000	3000	4,000
10	25000		13000	4000	4000	4,000
11	18000		10000	3000	3500	1,500

- No funding has been made available for WP 6.2 for Cali so far. The funds in the first column are a projection of cost and it will be explored whether they partly can be met locally
- Partial local funding will be explored for yrs 09, 10 and 11

SWITCH City Storyline Hamburg 05 Feb 2008

Description of the city and its water resources

The city Hamburg has an increasing population and is one of the fastest growing cities in Germany. The expected population growths (60.000 people until 2020) and the expanding harbour evoke a predictable need for urban development. Related to this background the municipality Hamburg developed a model of qualitative and sustainable urban growth. The objectives were defined in the key concept 'Metropolis Hamburg – expanding city'. The urban development mainly takes place in the south of the city, in particular on the river island of Wilhelmsburg. The island will be scene of the International Building Exhibition (IBA) 2013 and the International Horticultural Exhibition 2013.

Hamburg has a central water supply system with several wells which tap voluminous aquifers. Since the mid 1980th the average water consumption per capita was reduced. Despite of the increasing population, there is no shortage of drinking water expected in future. Hamburg has a sewerage system which contains over 99% of all inhabitants. The sewerage system is connected with a central sewage treatment plant which ensures a progressive multi stage treatment of waste water.

Main water pressures and issues

Hamburg has following main water pressures and issues:

- Flood risks, caused by the river Elbe and the North Sea (possibly increasing by the global climate change)
- Fluvial flooding in the inland, caused by storm water
- Pollution of the surface waters caused by industries, agriculture and storm water (to ensure the quality of surface waters a storm water treatment is necessary)
- High/ rising ground water tables (caused by the reduction of ground water extraction)
- Limited capacity of the existing sewerage system so that the present sewers cannot guarantee additional effluent
- Water as an element to develop attractive locations (facilitate a high quality of housing, increase the quality of life and attract new groups of inhabitants)
- Water management in districts in conversion (the urban development should be based upon the existing technical infrastructure)

The island of Wilhelmsburg, as the main area of the future urban development, is characterised by the combination of 'technical' water management problems (flood risks, storm water management etc.) and 'urban planning' demands (water as an element to develop attractive locations etc.). Regarding these problems the learning alliance Hamburg decided, to focus the SWITCH activities on the river island of Wilhelmsburg.

City Coordinator:

The demonstration city Hamburg has two city coordinators, a representative for the municipality and a representative for workpackage 5.1

- Heike Langenbach, HafenCity University Hamburg - Landscape Architecture and Planning (also facilitator learning alliance)
- Andreas Kellner, State Ministry of Urban Development and Environment Hamburg

Learning Alliance members goals and aspirations

The issues, goals and aspirations of the key stakeholders of the learning alliance Hamburg are:

LA member	Issues, goals and aspirations
HafenCity University Hamburg – Landscape Architecture and Planning	Analysis of state of the art and best practice of Water Sensitive Urban Design (WSUD) solutions. Implementation of the principles of WSUD (demonstration project)
State Ministry of Urban Development and Environment Hamburg (several departments)	The municipality is interested in further research activities and demonstration projects in the themes WSUD, storm water management and sustainable water management to improve the every day work.
International Building Exhibition Inc.	The IBA will demonstrate innovative projects in relation to the future of urban design. Different aspects concerning a sustainable urban water system play a central role.
Hamburg Water Inc.	Interest in further research and demonstration activities to facilitate a sustainable storm water management.
Landesbetrieb Straßen, Brücken und Gewässer	The Landesbetrieb (former part of the State Ministry of Urban Development and Environment Hamburg) is interest in research and demonstration activities regarding a sustainable urban water management.
Additional members from administrations or comparable organisations: Hamburg Port Authority, chamber of commerce , district authority Harburg, water association Wilhelmsburger Osten, water association Verringkanal, etc.	Interest in practical related research activities for a sustainable urban water management. Involved in the development of an 'Integrated Urban Water Management Plan' (IUWM) on the river island of Wilhelmsburg.
Additional members from NGOs: Future council Hamburg, union for environmental protection and conservation, botanic association, association future of the river island of Wilhelmsburg, citizens association Wilhelmsburg , advisor council Wilhelmsburg, etc.	The NGOs are in particular interested in the development of the IUWM plan of the river island of Wilhelmsburg.

SWITCH in the City

Hamburg wants to support sustainable and innovative solutions of water management in districts in urban transformation processes. There are a number of critical issues, which urgently need solutions, facing the environmental quality of the water system as well as progressive risks and water problems under global environmental change. This requires

innovative water management solutions which are able to combine innovative water techniques and modern urban planning and improve cross linkages.

The demonstration city Hamburg wants to prepare an 'Integrated Urban Water Management Plan' (IUWM) for the river island of Wilhelmsburg. Further a small-scale demonstration project for 'Water Sensitive Urban Design' (WSUD) on the river island of Wilhelmsburg is in progress of preparation. The aim is to manage the various interests in terms of water and to gain a balanced and self-sufficient water system. The water management system should be based on indicators of sustainability (ecological, economical, social and cultural benefits). The sustainable water management closely has to take into account the future urban development and should be related to the interests of the International Building Exhibition 2013. The application for the island of Wilhelmsburg should support the lasting establishment of a 'Water Sensitive Urban Design' as well as 'Integrated Urban Water Management' in the municipality of Hamburg.

Major activities and impact of SWITCH in month 1-24

In the following the major activities of SWITCH in Hamburg in the first 12 months were listed:

- Scoping visit (including excursion, workshop with the members of the learning alliance and a scoping report)
- Establishment and working process of the Hamburg learning alliance (core members, project management LA, several meetings LA, support of research activities WP 5.1, interviews about water management, preparation of the demonstration project Hamburg etc.)
- Review of planning strategies of WSUD in Hamburg (deliverable 5.1.1; 5 small scale case studies current solutions and best practices WSUD; expert interviews, document analyses, site inspection)
- Analysis responsibilities and decision making mechanisms in Hamburg
- Start of the demonstration project Hamburg (refine the project etc.)
- Prepare 'Analysis of the Urban Water System Hamburg' (in cooperation with theme 1)
- Start analysis concerning indicators of sustainability (support WP 1.1)
- Prepare analysis 'Storm water reuse in Hamburg' (support theme 2)
- Dissemination activities (press release, content homepage, etc.)
- Linkages with other demonstration cities (excursion Zaragoza)
- Support the organisation of the SWITCH coordination workshop in Hamburg

In the months 13 – 24 following major activities are realised:

- Expansion of the LA with 15 new members
- 26 interviews with the members of the LA, documentation of activities related to LA (e.g. documentation events, preparation googlegroup etc.)
- Preparation briefing notes for IUWM on Wilhelmsburg
- Workshop 'IUWM on the river island of Wilhelmsburg in the year 2030' in cooperation of WP 1 and WP 5.1. Development of a vision for IUWM in the year 2030.
- Small conference 'Water Sensitive Urban Design' with external experts from 'Leidsche Rijn' (together with the workshop 'IUWM').
- Preparation of the international conference 'WSUD' together with the IBA (the date of the conference was postponed).
- Research activities WP 5.1: analysis sustainability small scale case studies WSUD in Hamburg and development first rough draft design manual WSUD (deliverable 5.1.2)
- Several meetings to prepare a small scale demonstration project of WSUD.
- Carrying out of three training colleges related to the topic 'WSUD' by request and

cooperation with single members of the LA.

- Participation on SWITCH training workshops related to LA facilitation, process documentation and monitoring/evaluation. Participation SWITCH scientific meeting Tel Aviv.
- Dissemination activities (enlargement homepage, press release etc.)
- Build contacts international LA (Lodz, Birmingham, Uterecht/Leidsche Rijn etc.)

Linkages of SWITCH with other regional/city water initiatives

There are linkages of the SWITCH activities in Hamburg with other regional water initiatives (in particular with planned research projects):

- DIPOL: The planned Interreg IVB project 'Climate change induced influence on diffuse pollution and the assessment of impacts fort he coastal area' has also a case study on the river island of Wilhelmsburg.
- Klimzug Nord: The planned consortium project is supported by the Federal Ministry of Education and Research. The project will analyse the required measures to adapt the metropolitan region Hamburg on the effects of the global climate change (nature conservation, flood protection, storm water management, urban planning, landscape design etc.). A demonstration project on the river island of Wilhelmsburg is planned.

Furthermore there is an interchange with the persons dealing with the research activities FLOWS (Flood Plain Land Use Optimising Workable Sustainability), UWC (Urban Water Cycle) and RIMAX (Risk Management for Extreme Flood Events) which take place in Hamburg.

The NEXT 18 Months

Summary of the main points/focus of SWITCH activities in the next 18 months

In the next 18th months the SWITCH project Hamburg focuses on following activities:

- The SWITCH small scale demonstration project related to WSUD should be started. The demonstration project will be realised together with the IBA Inc. At present two possible demonstration projects are discussed. The final decision will be made at a planned appointment at the beginning of month 27. The first activities for the implementation the demonstration project will be started (standards urban design competition, evaluation planning process etc.) For details compare chapter 'demonstration'.
- Continue the already started IUWM plan for the river island of Wilhelmsburg. The IUWM plan will be prepared by the WP 5.1, WP 1, the municipality Hamburg and the local LA. Three workshops should be carried out with following topics: 'Scenario planning for IUWM', 'Use of Decision Support Systems for IUWM', Analysis of different options for IUWM
- The international conference dealing with the topic 'Water Sensitive Urban Design' should be carried out together with the IBA Inc. International speakers should present the experiences with sustainable water management and the cooperation with urban planning. The conference is a supplement to the existing deliverables of the DOW. The conference was already planned in the last 12 month period but the date was postponed by request of the IBA Inc. As alternative a small conference of WSUD was carried out combined with the SWITCH visioning workshop. Nevertheless it is still planned to carry out the international conference.
- WP 5.1 continues the work in Hamburg with the evaluation of WSUD-solutions on the river island of Wilhelmsburg. Also the international cooperation with other case studies of WSUD should be supported. Furthermore the 1st rough draft of the design manual of WSUD should be discussed with the members of the LA. Based on the results of the

discussion and further research activities a 2nd draft of the design manual will be prepared. (The originally planned presentation of the 1st draft of the design manual in month 22 was postponed to the next LA meeting in month 27).

Additional activities in the next 18 months in Hamburg are:

- Dissemination activities (press releases, extension homepage, presentation SWITCH on regional events, development brochure IUWM Wilhelmsburg, SWITCH newsletter Hamburg etc.)
- Learning alliance (further enlargement of the LA, continue the working process of the LA, process documentation with reflection, finishing stakeholder analysis, newsletter, monitoring LA process, facilitation communication within LA etc.)

Issues to be addressed

The demands and issues of SWITCH were listed above.

SWITCH goals and objectives – Impact to be realised

Details compare deliverables learning alliance, research activities, demonstration activities and dissemination activities.

Learning Alliance Activities

The activities based on the 'SWITCH Learning Alliances progress report Hamburg February 2008'. The emphasis of the next 18th month are the IUWM plan and the small scale demonstration project on the river island of Wilhelmsburg.

Activity	Specific objective	Task	Deliverables	Milestones
Demonstration activities		Preparation and implementation small scale demonstration project WSUD (workshops, support urban design competition etc.)		Months 25-36
Demonstration activities		Continue planning process IUWM Plan Wilhelmsburg		3 workshops Months 25-42 (Scenario planning, Decision Support System, Options WSUD)
Enlargement LA		Further enlargement LA (scaling up of WSUD / IUWM and inclusion of social marginalised groups)		Months 25-42
Facilitation		Complete stakeholder analysis		Month 25-27
Facilitation		Process		Month 25-36

		documentation (paper reflection change of LA)		
Facilitation		Facilitation communication within LA		Month 25-42
Dissemination/ interchange research		International conference WSUD		Conference / report Month 25 – 36 (Depending on cooperation partners)
Dissemination/ interchange research		Discussion and feedback from LA for the design manual WSUD (1st rough draft and 2nd draft)		Month 27
Dissemination		Dissemination activities like press releases, extension homepage SWITCH Hamburg etc.		Months 25-42

Research activities

Hamburg is connected with several research activities of SWITCH. In the centre of attention is WP 5.1 'Water Sensitive Urban Design' (WSUD). The contention to WSUD corresponds with the requirement of the every day work in Hamburg, a combination of 'technical' water management problems (flood risks, storm water management etc.) and 'urban planning' demands (water as an element to develop attractive locations, planning in urban transformation processes etc.). Apart from WP 5.1 the demonstration city Hamburg will cooperate with other research activities in particular WP 1.1 (IUWM plan for the river island of Wilhelmsburg). A cooperation with WP 5.2 is planned (case study analysis of urban agriculture on the river island of Wilhelmsburg). Furthermore cooperation with WP 2.1 (storm water management) and WP 5.3 (Natural Systems and Urban Water Cycle) are discussed in regard with single problems of the demonstration project and the IUWM plan for the river island of Wilhelmsburg. In the next 18 months following activities are planned:

Work package	Specific objective	Task	Deliverables	Milestones	Lead Partner
1.1	IUWM	3 Workshops 'Scenario Planning for IUWM', 'Use of decision Support Systems for IUWM' and 'Analysis of different options for IUWM'		3 Workshops	WP 1.1 WP 5.1 FHH/ BSU
1.1	IUWM	MSC about IUWM			WP 1.1

		on the river island of Wilhelmsburg			
2.1 / 2.2	Urban storm water management	Possible integration in IUWM plan Wilhelmsburg (topic sustainable storm water management and water pollution control)			WP 2.1 WP 2.2 WP 5.1 FHH/ BSU
5.1	Water Sensitive Urban Design	Presentation and discussion design manual WSUD (1st draft) to LA	D 5.1.2	Workshop	WP 5.1 FHH/ BSU
		Small scale demonstration project of WSUD			WP 5.1 FHH/ BSU
		Analysis WSUD-solutions on the river island of Wilhelmsburg		Report	WP 5.1 FHH/ BSU
		Discussion design manual WSUD (2nd draft) with LA	D 5.1.3	Workshop	WP 5.1 FHH/ BSU
5.2	Urban Agriculture	Case study analysis of urban agriculture on the river island of Wilhelmsburg		Report	WP 5.2 FHH/ BSU
5.3	Natural Systems and Urban Water Cycle	Possible integration in IUWM plan Wilhelmsburg (topic ecohydrology)			WP 5.1 WP 5.3 FHH/ BSU
6.	Policies	Interchange insti-tutional mapping and analysis planning process demonstration project			WP 5.1 WP 6.?
6.3	Social inclusion	Case study social inclusion on the river island of Wilhelmsburg			WP 5.1 WP 6.3 FHH/ BSU

Demonstrations

The demonstration project Hamburg is divided into two parts. On the one hand an 'Integrated Urban Water Management' plan (IUWM) for the river island of Wilhelmsburg will be developed in cooperation of WP 5.1, WP 1. and the municipality of Hamburg. On the other

hand a small-scale demonstration project of WSUD will be realised in cooperation of WP 5.1, the municipality of Hamburg and the IBA Inc.

The IUWM plan will be developed together with the members of the Learning Alliance Hamburg. On the SWITCH workshop at the 31st August a collective vision for the 'Urban water management on the river island of Wilhelmsburg in the year 2030' was developed with the members of the learning alliance and external experts. The vision 2030 'Make Water Visible' is the starting point for further planning and demonstration activities on the river island of Wilhelmsburg. In the period of month 25 – 50 a series of 4 workshops aiming at the involvement of the stakeholders in developing the IUWM plan is planned. The next workshop 'Scenario Planning for IUWM' is planned in month 27. At the workshop the translation of the vision into a set of sustainable indicators will be discussed. According to the water management problems which will be made subject of discussion by the participants of the IUWM planning process different SWITCH WP will be integrated. Possible topics could be storm water management, urban agriculture or ecohydrology. Because the detailed content of the IUWM plan is unknown at present the WPs only signal their readiness but no binding cooperation is arranged. In the city story 13-24 the development of a strategic water management plan for the river island of Wilhelmsburg was planned, which should contain the short term demands of WSUD until the International Building Exhibition in the year 2013. There are huge overlaps of the content of the 'IUWM Plan Wilhelmsburg 2030' and the 'Strategic Water Management Plan'. Furthermore the IBA Inc. commissions a private consulting office to prepare a regional survey of the surface waters on the river island of Wilhelmsburg. Hence the coordination of the several planning activities was discussed within the core members of the LA to coordinate the several planning activities. It was decided to break off the 'Strategic Water Management Plan' and to introduce the content in the 'IUWM Plan'. Hence the original milestone 'Strategic Water Management Plan' is displaced by the 'IUWM Plan'.

A small-scale demonstration project of WSUD will be realised on the river island of Wilhelmsburg. At present two project ideas are discussed. The final decision for one of these projects will be made at an appointment at April 1st 2008. In the following both projects are described:

- Water Sensitive Urban Design 'Haulander Weg' - Sustainable urban design, storm water management and pollution control in new development sites: The SWITCH demonstration project is planned associated with the project 'Haulander Weg' of the International Building Exhibition 2013. The planned residential site will have 700 living units and will be the biggest ecological demonstration settlement in Hamburg. The buildings should be developed according to the up-to-date standards of energy-saving. Furthermore the realisation of eco-sanitation solutions is discussed. In this planning site the SWITCH demonstration project will develop WSUD-solutions to improve the water quality of the adjacent ditches, adapt the storm water management on the global climate change and to develop attractive locations at the water. For the public open space alongside the ditch as well as a possible central green space of the settlement a detailed planning for WSUD-solutions will be realised. Furthermore an overall concept and a design manual for WSUD will be developed to support the implementation of WSUD-solutions in the whole quarter. The interdisciplinary planning process of WSUD solutions will be monitored (supported by WP 6.) and the impact of the finalised project on the inhabitants will be evaluated.
- Water Sensitive Urban Design 'Weltquartier Wilhelmsburg' - Sustainable urban design and storm water management in quarters in conversion: The SWITCH demonstration project is planned together with the project 'Weltquartier Wilhelmsburg' of the IBA. 1,700 people from over 30 different countries live in the former working-class

residential site. In order to improve housing conditions and create a conflict-free neighbourhood, the quarter is to be reorganized and redeveloped. Therefore an 'Intercultural Planning Workshop' is carried out by the IBA to investigate the residents' requirements for redevelopment. The demonstration project of WSUD should contribute to the redevelopment of the public and private open space and should facilitate a sustainable storm water management (disconnection of the present storm water sewers, adaptation on global climate change etc.). The concerns of WSUD will be integrated in the ongoing communication and citizens engagement processes. The different cultural behaviour with water and open space from the different nationalities and the consequences for the design of WSUD-solutions is analysed. For a site in the adjacent park as well as in the collective gardens measures for the reconnection from the storm water sewer and for the treatment of the storm water will be developed. It is analysed how innovative WSUD-solutions could be implemented in quarters in conversion. The interdisciplinary and intercultural planning process will be monitored (supported by WP 6.) and the impact of the finalised project on the inhabitants will be evaluated.

The already started planning process of an IUWM plan for the river island of Wilhelmsburg ensures the connection between the planned small scale demonstration project and the other activities of the SWITCH learning alliance. So the ideas for a demonstration project based on the objectives of the vision 'Make water visible' which was developed from the learning alliance within the IUWM plan. There are several approaches for scaling up of the results of the demonstration projects:

- The demonstration projects could serve as key project for a sustainable storm water managment and WSUD-solutions on the island. The implementation is facilitated by the IUWM plan and the planned customised design manual of WSUD.
- The ideas of WSUD will be scaled up in the municipality of Hamburg. The learning alliance involves the core organisations which are responsible for the implementation of the water management in Hamburg.
- The demonstration project of WSUD should be scaled up on an international level. The small scale demonstration project will be part of the IBA 2013 in Hamburg. Therefore the demonstration project of WSUD will be presented to a wide audience of international visitors.

Following activities for the small scale demonstration project are planned in the next 18 month (compare demonstration project template Hamburg)

- Selection small scale demonstration project (appointment with all persons responsible is already arranged)
- Participation planning process of the IBA projects (contribution urban design competition, develop of a set of indicators for scoring etc.)
- Develop concept WSUD for whole quarter (preparation customised design manual, urban design workshops etc.)
- Construction plan and design documentation small scale demonstration site
- Implementation of the small scale demonstration site
- Survey present conditions water cycle and nature
- Monitoring of the planning process of the demonstration project

Training plans

Three training colleges concerning WSUD were already carried out in the municipality of Hamburg. There are following additional offers of training activities:

Training activity	Purpose	Target audience	Type of materials/delivery	Deliverable
Further Training college related to WSUD	Combination of sustainable water management and landscape design	Open (students)	Training college	
Training and dissemination activities related to WSUD in the month 37-48	Dissemination of the approach of WSUD	Interdisciplinary audience (city planners, architects, engineers etc.)	1 Symposium 5 Lectures 1 Exhibition 2 Workshops 1 Training college with certification	D 5.1.4 T

Dissemination activities

Dissemination activity	Purpose	Target audience	Deliverable
Conference WSUD (month 25-42)	Organisation of an international conference about WSUD with additional dissemination (website presentation, press release etc.)	Members LA, Professionals of urban and landscape design and water management	Additional output
Website (month 25-42)	SWITCH Hamburg website	General public, persons interested	
Event (month 26)	Presentation of the municipality of Hamburg on the Symposium 'Cities of the Future – Strategic Planning for Water Sustainability'		
Events (month 25-42)	Presentation of the SWITCH project on other events in Hamburg and in particular on the river island of Wilhelmsburg	General public, persons interested	
1 Symposium 5 Lectures 1 Exhibition 2 Workshops 1 Training college with certification (month 37-48)	Dissemination of the approach of WSUD	Interdisciplinary audience (city planners, architects, engineers etc.)	D 5.1.4 T

Budget requests for LA activities

In the next 18 months the LA Hamburg has a budget request. With the further concretisation of the demonstration project and the IUWM plan the workload related to the facilitation of the

LA will increase. Therefore it is of major importance to shift the saved budget (in particular staff costs) that were not spent in first 24 months to the following period of SWITCH (about 23.500 EUR).

Furthermore to guarantee the co-financing of the planned international conference 'WSUD' funds (cost estimation 5.000 €) are needed (travel and subsistence for national and international speakers, dissemination costs etc.) in 2008. For the attendance at SWITCH LA training activities a budget of 3.000 EUR is required.

For the year 2009 and 2010 we need a budget of 22.750 EUR per year for staff costs and 3.000 EUR per year for training activities.

SWITCH Hamburg timeline of activities

- Month 25-36, Discuss WSUD design manual (1st rough draft) with LA, preparation of 2nd draft design manual (deliverable 5.1.2 and 5.1.3)
- Month 25-36: Evaluation of urban planning strategies, which are appropriate to integrate sustainable water system in town districts (deliverable 5.1.3)
- Month 25-36: International conference 'Water Sensitive Urban Design'
- Month 25-42: Workshops IUWM (3 workshops Theme 1)
- Month 25-42: IUWM plan for the river island of Wilhelmsburg
- Month 25-42: Decision small-scale demonstration project WSUD, starting the implementation of the demonstration project, starting monitoring demonstration project
- Month 25-42: Dissemination activities (press releases, extension homepage SWITCH Hamburg etc.)
- Month 25-42: Co-operation with the international members of the SWITCH consortium
- Month 25-42: Learning Alliance (Further enlargement of the LA, continue the working process of the LA, preparation IUWM plan, process documentation, evaluation etc.)
- Month 25-42: Further training college 'WSUD'
- Month 37-48: Implementation of WSUD values in urban transformation processes (deliverable 5.1.4)

Links to other areas of the SWITCH DOW

None

Description of the city and its water resources

Description of city including water sources, growth projections to 2030, water demands and constraints, status of wastewater management

Lima:

Metropolitan Lima is the capital of the Republic of Peru and is divided administratively into 43 districts. Each district has a Mayor and a Municipal Council, which are elected democratically by the residents of the District. Metropolitan Lima also has a Mayor and a Metropolitan Municipal Council with certain specific functions. The Metropolitan Municipality of Lima also carries out functions of a Regional Government since it does not form part of any administrative region, in accordance with Article 65 of Law 27867 on Regional Governments passed on November 16, 2002.

The Constitutional Province of Callao is another province of the Lima Department and is divided into six districts. Since it is at a different level from the other provinces, it also forms a region, the Regional Government of Callao.

Peru has 24 departments and 26 Regional Governments (24 Regional Governments of the departments, plus the Regional Governments of Lima and Callao).

The city of Lima[1] (including Metropolitan Lima and the Constitutional Province of Callao) has an area of 2,794 km^2 and a population of 7,765,151 (INEI, 2005), distributed into 49 districts. 51% of the population is female, while the population growth rate is 2.1% (INEI, 2002).

The city of Lima is located in the central part of Peru on the Pacific Ocean. Although it was initially founded on a valley (the Rímac River), today it extends to other surrounding valleys (the Chillon and Lurín Rivers) and over extensive desert areas. Due to this latter characteristic, it is considered the most extensive city in the world built on a desert, after Cairo.

As a result of the nearly non-existent precipitation that Lima receives (around 25 mm per year), the main sources of water in the city are surface and underground water. This leads to a situation where treated and untreated wastewater is seen as an important alternative source for irrigation water.

Surface water. Comes from the Rímac, Chillon and Lurín Rivers. Their average monthly historical flow is 39 m^3/s , of which 29.5 m^3/s comes from the Rímac (SENAMHI, 2005), 5.1 m^3/s from the Chillon (SENAMHI), and 4.5 m^3/s from the Lurín (INRENA, 2005).

75% of the water available in the city is used for human consumption, followed by agriculture (22%) and industrial and mining activities (INRENA, 2005).

The water used for agriculture is distributed by the Users Boards[2] of the three rivers, among the farmers associated in different Irrigators Commissions[3].

[1] Throughout this document, we will use the term the city of Lima, assuming, to simplify things, that this includes Metro Lima and the Constitutional Province of Callao.

[2] The Users Board is the organization that represents all of the water users in the irrigation district or sub-district, and is comprised of one or two representatives of each Board of Directors

Users Board

This process is carried out in coordination with the national authority (the Superintendence of Water Resources of the INRENA) and local authorities (Rimac-Chillon-Luring Technical District Administration of Irrigation) and is responsible for the use of irrigation water.

Underground Water. Comes from the filtration of the Rimac, Lurin and Chillon Rivers. Currently, underground water is extracted at a rate of 8.3 m^3/s (SUNASS, 2002), and is primarily used for human consumption and industrial activities.

Wastewater. 85.4% of the city's population (SEDAPAL, 2005) has access to a sewer system which collects 17.5 m^3/s of wastewater. While there are more than 40 experiences of wastewater treatment and re-use, the volume treated (1.6 m^3/s) represents only 9.2% of the total (SEDAPAL, 2006). As a result, most of the wastewater (90.8%) is discharged into the Rimac River or the sea, causing pollution problems both for the crops that are irrigated as well as the risk of proliferation of endemic diseases and an alteration of the environmental equilibrium.

Urban Agriculture in the city of Lima

There are two areas of municipal territory in which urban agriculture is practiced: peri-urban areas and intra-urban areas.

Agriculture in peri-urban areas. From the beginning of the 20th Century to the present day, the agricultural area of Metropolitan Lima has shrunk from 600 square kilometers (98% of the total area) to 125 Km^2 (21% of the total surface area), as shown in figure 1. It should be noted that this urban growth originally took place on high-quality agricultural land, and more recently, on dry land on the lower part of the watersheds of the Rímac, Lurín and Chillon Rivers.

According to the Patterns of Agricultural Land Use of the Users Boards of the Chillon, Rímac and Lurín River, at present, 12,680 hectares are being irrigated in Metropolitan Lima, belonging to 7,601 agriculturalists organized into 35 irrigators commissions.

While the Users Boards encompass most agricultural areas, other agricultural areas should also be considered, like those of Villa El Salvador (130 hectares), San Juan de Miraflores (12 hectares) and Ventanilla (50 ha), which are irrigated exclusively with water coming from wastewater treatment plants like those of San Juan, Huascar and

of the Irrigators Commissions that are present, according to Article 60, two delegates to the General Assembly elected by each Irrigators Commission; one delegate of the Sanitation Service Providers; and one delegate chosen by the water users from the energy sector, another from the mining sector and one chosen by other uses, where appropriate (Source: Regulation of the Administrative Organization of Water, Supreme Decree No. 057-2000-AG).

[3] The Irrigators Commission is the organization that represents the users of water for agricultural purposes: growing crops or animals in an irrigation sector or sub-sector. Its Board of Directors is elected by universal and secret vote by the eligible users of water. (Source: Regulation of the Administrative Organization of Water, Supreme Decree No. 057-2000-AG).

Ventanilla.

The most important crops in the Rímac River basin are vegetables, and to a lesser extent, American grass and chala (maize). In the Lurín River basin, farmers grow fruits, ornamental plants, corn, chala, and vegetables; while chala dominates the Chillon River basin, and to a lesser extent aromatic plants.

Agriculture in intra-urban areas. With regard to the agriculture practiced in intra—urban areas, it should be mentioned that it began as a strategy implemented by the people to increase their access to food, and in other cases, to generate income and improve the environment. It is supported by the agricultural customs and traditions of the new inhabitants of the city who had originated in rural areas of Peru.

The surface area on which intra-urban agriculture is done is small compared to peri-urban areas, most of the community areas have less than 1,000 sq. meters, while household plots range from 4 to 50 m^2. This kind of farming uses almost now chemicals, and its main source of water for irrigation is piped water.

It is also important to point out that this practice has been recognized by District Municipalities in Lima, who are integrating it into their anti-poverty and hunger strategies/policies in urban areas (i.e. the Municipality of Villa Maria del Triunfo, Lurigancho-Chosica). The Municipality of Metropolitan Lima has also expressed its interest in this practice and its role in the urban management of the districts of the city of Lima, which was reflected in the organization of an event called "Urban and Peri-Urban Agriculture in Metro Lima: a strategy for fighting poverty and food insecurity." The event was co-organized by IPES and the Urban Harvest program of the International Potato Center.

Main water pressures and issues

Lima is a desert city with little availability of water. However, more than 90% of the wastewater that is originated in this city are discharged without any treatment into the sea. The challenge of this project is to promote the treatment and reuse of wastewater for urban agriculture and green areas, thus taking advantage of wastewater in other alternative ways.

City Coordinator:

IPES – Promotion of Sustainable Development and the Minsitry of Housing, Construction and Sanitation with the institutions in charge of leading the SWITCH Project.

The Coordinator of the Lima SWITCH Project is Mr. Gunther Mertzthal.

Learning Alliance members goals and aspirations

Combined description of goals and aspiration here – specific key stakeholder goals and aspiration in table

Despite the lack of funds available to establish a Learning Alliance in the city of Lima, the leaders of the Project have brought together a group of stakeholders directly related to the issues and the project.

LA member	**Issues, goals and aspirations**
IPES	To promote integrated systems for the treatment of wastewater and its reuse for urban agriculture and

	greening. One of the objectives of IPES for the project is to produce policy guidelines around this issue.
Ministry of Housing, Construction and Sanitation	To promote integrated systems for treating wastewater and re-using it for urban agriculture and urban greening; thus one of the objectives of the Ministry in the project is to create regulations for this activity.
La Molina Agrarian University	The university is interested in the research on the use of alternative water sources for agriculture.
SEDAPAL	SEDAPAL is in charge of most of the water treatment plants in Lima and is a very important participant in the process of assessing the treatment and re-use of water in Peru. SEDAPAL is interested in the results of the project's research, especially on the efficiency and sustainability of wastewater treatment plants.

In addition, at the beginning of June, a workshop was held with IRC and ET on the "Methodology of the Learning Alliance", in order to learn about what the methodology consists of, and how to implement and manage it.

Then, in the same month, the launch event for the Lima SWITCH project was held, with 36 institutions in attendance (local and national governments, private companies, educational and research institutions, NGOs, GROs, etc.) involved in the issue of waste-water re-use and/or urban agriculture. During the event, a letter of intention was given to each of the institutions in order to confirm their interest in the methodology presented by IRC on the Learning Alliances. Of all institutions present, 23 signed the letter, saying that in addition to other benefits, the methodology will make it possible to strengthen the experiences that they are implementing related the issues involved in the Lima SWITCH project.

SWITCH in the City

Role of SWITCH in the City (What integrated urban water management might look like for city X, SWITCH approach and problems SWITCH will be trying to tackle (during life of SWITCH project)

IPES and the Ministry of Housing, Construction and Sanitation have together identified that there is a legal-regulatory vacuum with respect to the regulation of the treatment and re-use of wastewater for productive and/or recreational purposes.

Based on this legal vacuum, which makes it impossible to implement treatment and re-use systems in Peru, one of the primary objectives of the SWITCH Project in Lima is to create policy guidelines and regulations for the promotion of integrated systems of wastewater treatment and re-use for the purposes of urban agriculture and urban greening.

To reach this objective, a research effort is underway to assess the current situation regarding wastewater treatment and re-use in the city of Lima, as well as the state of urban agriculture in Lima. This process is being carried out with an eye to creating the policy and legal/regulatory framework that is most consistent with the reality in Peru regarding these issues.

Major activities and impact of SWITCH in first 12 months *(scoping studies/workshops, demos, research, interactions with stakeholders, etc.*

The activities carried out by the SWITCH Project during its first year were (2007-2008):

- Between January and June, 2007, the Lima SWITCH Project studied different experiences of wastewater re-use and urban agriculture in Metropolitan Lima, resulting in a Panorama of Wastewater Re-use in Metropolitan Lima and a Panorama of Urban Agriculture in Lima.

- From June 4-6 2007, the Learning Alliances workshop was held for the SWITCH Lima Project.

- On June 7, 2007, there was a Launching Event for the Lima SWITCH project, with 36 institutions present involved with the issues of wastewater reuse and/or urban agriculture. During the event, a letter of intention was distributed to each of the invited institutions in order to confirm their interest in the Learning Alliance methodology. Of all of the institutions present, 23 signed the letter.

- Between July and September, the Project team worked on creating a typology of the state of waste-water re-use and the state of urban agriculture in the city of Lima, and in addition, 6 experiences of each type (6 wastewater re-use cases and 6 UA cases) were selected, and then studied more in depth, to produce case studies that will serve as the main input for the creation of the policy guidelines, which is one of the main objectives of the Lima SWITCH Project.

- In September, work began on coordinating the case studies. For each experience selected, thorough research will be done on five pre-defined dimensions (institutional, social, technical, economic, environmental).

- In October, those stakeholders interested in the Learning Alliances were given a "Form for Collecting Information and Training Needs" (TNAs) regarding the issues of the reuse of wastewater and urban agriculture, and a CD-ROM with the webpage of the SWITCH Lima Project and the products produced to date in the project. IPES and the Ministry of Housing, Construction and Sanitation are currently processing these forms in order to identify the contents and methods to use to inform and train those involved.

- Currently, the project is conducting the case studies, which will be used as the main input for the design of the policy guidelines on the treatment and re-use of wastewater for urban agriculture and greening, which is one of the objectives of the Lima SWITCH Project.

Linkages of SWITCH with other regional/city water initiatives

The Lima SWITCH Project has been tied to the Ministry of Housing, Construction and Sanitation, which is in charge of regulating everything related to sanitation and water. Therefore, the topic being addressed in this project is a priority, which led SWITCH to cooperate directly with this Ministry.

Also the SWITCH Lima Project is linked at national level with the sub-committee "Safe Water" of the Ministry of Housing, Construction and Sanitation where it concerns the treatment and reuse of residue water in order to profit the resource of water in Peru. Using it in a long lasting way and trying to avoid pollution by wastewater dumped in the sea.

At international level the SWITCH Project is linked with the Conference "LATINOSAN" and with the Network of Management Waste water for Latin America and the Caribbean (REGAR-LAC), spreading the knowledge acquired in the process of investigation and exchanging experiences with other countries of Latin America. This has allowed to extend the horizons of investigation of the project SWITCH and to know new technologies and managing of the residual water that can be applied in Lima and other cities.

The NEXT 18 Months, the objective is to bring all the activities under the different workpackages in one logical set of actions. I suggest you also include here also the LA budget at the end

Summary of the main points/focus of SWITCH activities in the next 18 months

Planning of next 18 Months

During 2008, the following activities will take place:

WP 5.2

- In January 2008, the implementation of the demonstrative Project "OGAPU" will begin, which will consist of building a wastewater treatment plant to create a multi-functional park through the re-use of the water treated in the plant.
- By March 2008, the Project expects to have the final documents of the case studies on the re-use of wastewater and urban agriculture (6 cases each). The documents narrating each experience will be validated with all of the stakeholders involved.
- During April and June, based on the case studies and a review of the legal framework on the re-use of wastewater in Peru, the Policy Guidelines will be written, along with a set of regulations for the promotion of integrated systems for the treatment and re-use of wastewater in urban agriculture and urban greening.
- In June, the policy guidelines for the promotion of systems for treating wastewater and re-using it for urban agriculture will be validated with all of the participants in the Learning Alliance[4].
- During 2008, the process of systematizing and documenting the SWITCH Lima Project will take place.

LA Activities:

- In February of 2008, the Switch Lima Project presented to the SWITCH Global Coordination a proposal for implement the Learning Alliance Methodology for Policy development on reuse and treated wastewater in Urban Agriculture and Green Areas in the City of Lima. If the proposal will be approved the activities for LA will be implemented during the next 18 months (See activities in section LA activities).

Challenges

Obtaining financing from the global SWITCH project for implementing the Learning

[4] The Lima SWITCH Project will only be able to carry out this activity if the global project decides to fund the implementation of the Learning Alliance methodology in the city of Lima.

Alliance methodology, as well as raising some of the funds for the implementation of the OGAPU demonstrative project.

Issues to be addressed (be as specific as possible – eg not Stormwater)

Wastewater treatment:

1. Promoting integrated systems for the treatment and re-use of wastewater for the purposes of urban agriculture and urban greening.
2. Treating and re-using wastewater in the demonstrative project
3. Developing a legal/regulatory framework for the implementation of integrated wastewater treatment and re-use systems for urban agriculture and green areas.
4. Form a multi-stakeholder group using the Learning Alliances methodology, which is strengthened for the implementation of wastewater treatment and re-use experiences.
5. Facilitating change processes at the involved stakeholder through capacity development activities

SWITCH goals and objectives – Impact to be realised

The objectives of the SWITCH project are:

Create the policy guidelines and regulations for the promotion of integrated systems of wastewater treatment and re-use for urban agriculture and urban greening.

Establish a Learning Alliance (with representatives from local and national governments, universities, NGOs, CBOs, etc.) created and functioning that analyzes and validates innovative technologies and methodologies to design and implement wastewater treatment and re-use systems.

Implement the demonstrative pilot project "OGAPU", which consists of building a wastewater treatment plant in the district of Villa Maria del Triunfo, in order to re-use the treated water for creating a multi-functional park.

Learning Alliance Activities *(Could be table include workshops of LA with researchers or only LA, development of a MOU or other charter type, terms of reference instrument, training activities, conferences, etc.)*

Lima is no demonstration city, however under WP 5.2 a multi-stakeholder process is initiated, which is similar to a LA.

Activity	Specific objective	Task	Deliverables	Milestones
Learning Alliances Workshop	Learn the methodology, and how to implement and coordinate Las	Define roles and functions among stakeholders involved in the coordination of the LA	Final LA Workshop Report Report on the LA Methodology	June 2007
Identification of interested stakeholders	Identify the institutions interested in the Learning Alliance	Follow-up and monitor stakeholders involved in LA	Final Report on the SWITCH Project launch event	June 2007

	methodology.		Report on the Monitoring and Evaluation of LAs	
Send TNAs to involved stakeholders	To learn about the information and training needs of stakeholders involved	Send TNAs and follow-up letters Process responses	Design the surveys Training Needs Analyses (TNAs)	October 2007
Formally Establishment of the LA in Lima*	Creation of the alliance and its vision, objectives and organization, including formalization of roles and responsibilities	Create the Vision and objectives Define Roles and responsibilities in the LA	Document of the establishment of the LA	April 2008
Developing common planning cycle for policy formulation trough action research for different institutional levels*	Invite LA members for developing a planning cycle	Send letters to invite the LA members Elaborate an Agenda for the reunion	Write and send letters Report of the results of the planning cycle.	May - 2008
Review of the policy guidelines and regulations to promote the re-use of treated wastewater for urban agriculture and the irrigation of green areas.*	Invite LA members for workshops to validate the policy guidelines	Send letters to invite members of the LA to the workshops	Write and send letters Report of the Workshops	May - June 2008
Establishment and maintenance of an information and communications system among members of the LA (website, mailing list,	Create and maintenance a website Create and maintenance a mailing list Create and maintenance a virtual library	Design , translation and maintenance of the website Design , translation and maintenance of the mailing list Design , translation and	Reports of the inputs and changes for the website Reports of the inputs and changes for the mailing list Reports of the inputs and	July 2008 – October 2009

virtual library).*		maintenance of the virtual library	changes for the virtual library	
Design and implementation of a Training Program to help build capacity among members of the Learning Alliance*	Exchange information and training according to the demands identified in the TNAs	Prepare materials to inform and train Design and conduct workshops	Information and training materials Information and training workshop reports	August 2008 – September 2009
Information and exchange activities among Alliance members and the SWITCH Project*	Exchange information according to the demands of the LA members	Prepare meetings for information and exchange activities between LA members Create materials for the meetings	Reports of the meetings	June 2008 – October 2009
Carry out process documentation and monitoring of the activities and processes*	Documentation and monitoring of the LA process	Design methodology and instruments for process documentation and monitoring Implementation of the methodology and instruments for process documentation and monitoring	Monthly Reports about the activities of process documentation and monitoring	October 2008 – September 2009

* *(The Lima SWITCH Project will only be able to carry out this activity if the global project decides to fund the implementation of the LA methodology in Lima).*

Research activities

Overall description of research activities that will occur in City X and how these activities will be integrated to produce the impact and SWITCH city-wide outcomes (city coordinator to write)

Table on specifics of work activities (workpackges to contribute)

Work package	Specific objective	Task	Deliverables	Milestones	Lead Partner
WP 5.2	Create policy guidelines and regulations for the promotion of integrated systems for the treatment and re-use of wastewater for the purposes of urban agriculture and urban greening	Prepare assessments of the status of wastewater treatment and reuse and urban agriculture in the city of Lima Select experiences for case studies	Documents that summarize the status of wastewater treatment and re-use and urban agriculture in Lima Report on the criteria for the selection of the case studies Report on the selection of the case studies Final case study document Final policy guidelines document Final regulations document	February – April 2008	ETC

WP 5.2	Establish and put into action a multi-stakeholder group (representatives from national and local governments, universities, NGOs, CBOs, etc.), to analyze and validate innovative technologies and methodologies to design and implement wastewater treatment and re-use systems.	Learning Alliance workshop with IRC and ETC in order to learn how to apply the LA methodology Formation of the Multi-stakeholder group Monitor and Follow-up of the multi-stakeholder group	Final Report on the LA workshop Report on the LA methodology Document on the Monitoring and Evaluation of LA	January 2008	ETC
WP 4.1	Support the development of the research of WP 4.1	Visit from Alicia Roman to collect information on the product to be prepared Facilitate any information necessary for Alicia Roman	Final documents on ecological sanitation in Lima	July 2007	Wageningen University

Demonstrations

Description of demonstration activities that will take place in the City including: what research theme the demos are associated with :

- *purpose of demo*
- *applicability across SWITCH*
- *timeline*
- *deliverables*

Lima is not a demonstration city; however the coordinators of the project (IPES and the Ministry of Housing, Construction and Sanitation) are interested in carrying out projects which can validate the policy guidelines that the Lima SWITCH Project is going to develop. For this reason, these institutions have sought external funding in order to be able to implement demonstration projects.

As a result, IPES and the Ministry of Housing, Construction and Sanitation are implementing the OGAPU Project as a demonstration project.

This project is going to be implemented in the district of Villa Maria del Triunfo, and its primary objective is to contribute to combating urban poverty, improving food security

and encouraging community participation in the area of Tablada de Lurin, in the district of Villa Maria del Triunfo (Lima, Peru), through the implementation of a wastewater treatment system for reuse in multi-functional green areas.

The specific objectives are to treat and reuse 3.5 l/s of wastewater, develop 2.5 hectares of productive and multi-functional green spaces, and increase the incomes of 40 poor households by 30%.

This proposal seeks to develop a green area that will serve as a multi-functional park that includes the following components:

a. Social (strengthening the social fabric, recreation, inclusion, equity, etc.)
b. Economic (family savings, job creation and income enhancement, solidarity-based economy, etc.)
c. Environmental (Taking advantage of vacant spaces, solid and liquid wastes, improving the air quality, reducing global warming, etc.)

However, additional funds are needed for the implementation of the entire multi-functional area.

Training plans.

Training must be done with local stakeholders who are in charge of systems of wastewater treatment and re-use.

Training activity	Purpose	Target audience	Type of materials/delivery	Deliverable
1. Treatment technologies	Train local stakeholders in treatment technologies	Local stakeholders involved in the treatment and re-use system	Training materials	Report on the treatment technologies workshop
2. Technological innovations to improve the production systems of urban agriculture	Train local stakeholders in technological innovations to improve urban agriculture production	Local stakeholders involved in urban agriculture	Training materials	Report on the Technological innovations to improve production systems for urban agriculture workshop.
3. The use of Geographic Information Systems to plan Treatment and Re-use systems	Train local stakeholders in the use of Geographic Information Systems for planning treatment and re-use systems	Stakeholders interested in implementing integrated systems for wastewater treatment and re-use	Training materials	Report from the workshop on the use of Geographic Information Systems in planning treatment and re-use

				systems
4. Multi-stakeholder management of treatment and re-use systems	Train local stakeholders in the multi-stakeholder management of treatment and re-use systems	Stakeholders involved in promoting treatment and re-use systems	Training materials	Multi-stakeholder management of treatment and re-use systems workshop report.

Dissemination activities *(can include plans for conferences, newsletters, scientific publications, press releases, media campaigns, website, policy briefs, etc.)*

Dissemination activity	Purpose	Target audience	Deliverable
1. SWITCH Launching Event	Publicly launch the project and form the LA	Institutions related and / or interested in the issues of wastewater treatment and re-use	Final Report on the Lima SWITCH Project Launch
2. Lima SWITCH Project website	Present the project, objectives, activities done, progress, and products	Persons and institutions interested in wastewater treatment and re-use and UA	Lima SWITCH Project web page
4. Creation of the Project CD	Disseminate to people interested in the issues, the project, the products, and next steps	Institutions interested and/or involved in the issues of wastewater treatment and re-use and UA	SWITCH Project CD

BUDGET (for 18 months: 24-42)

a. Stakeholder mapping and analysis of main needs for change for successful fulfilling of required roles

Total = $2500

b. Formal creation of the alliance, establishment of its vision, objectives and organization

Alliance Creation Workshop
Operational costs
Total = $1200

c. Developing common planning cycle for policy formulation trough action research for different institutional levels

Feedback and consultation meetings
Total = $ 1500

d. Validation of the policy guidelines and regulations

2 workshops with 25 participants each
1 workshop with 50 participants
Materials
Transportation
Other related expenses
Total = $ 2000

e. Establishment and maintenance of an information and communications system among members of the LA (website, mailing list, virtual library).

Design of a communications and information system among members of the LA
Implementation of an information and communications system among LA members
Maintenance of the LA information and communications system
Translation of materials used and reports
Translation of the website from Spanish to English
Total = $10000

f. Design and implementation of a Training program to build the capacities of the members of the Learning Alliance

Design of the course
2 training courses
Trainer honorariums
Rental of workshop space
Other related expenses
Total = $5000

g. Exchanges of information and experiences among LA members and the SWITCH Project

Visits to experiences with LA members
Seminars on the Experiences
Total = $5000

h. Carry out process documentation and monitoring of the activities and processes

Documenting of change processes at different stakeholder levels
Total = $2400

i. Person in charge of coordinating the Learning Alliance

Salary: $600*18 months
Total = 10800$

Activity	Outputs	USD
a. Stakeholder mapping and analysis of main needs for change for successful fulfilling of required roles	Stakeholder analysis change needs	2.500
b. Formal creation of the alliance, establishment of its vision, objectives and organization	Vision and strategy for the LA	1.200

c. Developing common planning cycle for policy formulation trough action research for different institutional levels	Minutes of planning meetings	1.500
d. Validation of the policy guidelines and regulations	Workshop reports	2.000
e. Establishment and maintenance of an information and communications system among members of the LA (website, mailing list, virtual library)	Website updated at least once a month, at least 2 articles and reports published	10.000
f. Design and implementation of a Training program to build the capacities of the members of the Learning Alliance	Course notes and presentations of the trainings carried out	5.000
g. Exchanges of information and experiences among LA members and the SWITCH Project	At least two other SWITCH cities visited	5.000
h. Carry out process documentation and monitoring of the activities and processes	Change processes documented at least at one stakeholder level	2.400
i. Person in charge of coordinating the Learning Alliance – 18 months		10.800
Contingencies		1.000
Total		41.400

Total for LA = $ 41,400
Total for LA = € 29,155 (1 Euro = 1.42 USD)

LODZ

City Coordinator	LA Facilitator	Champion
Iwona Wagner	Monika Dzięgielewska- Geitz	Maciej Zalewski

The city and its water resources

Lodz (800 thousands inhabitants) is the second biggest city in Poland, located in the central part of the country. Collapse of textile industry in the late 80's and change of the City image from industrial city to the centre for education, science, development of new technologies and revitalisation, changes the expectations of the society, also regarding the city landscape and the quality of life. Additionally, decreases in water use forces changes in the water management approach and perception of the role of the water in the city.

Growth projections for the city of Lodz predict possible decrease from 768,9 thousands in the year 2005 down to 605,1 thousands in 2030, which may have further effect on water resources management. Recent activities undertaken by the city authorities (restructuring of motorways, airport, encouragement of new investors) may reverse this trend;

Main water pressures and issues

The city is located on the watershed divide between Vistula and Oder river and drained by 18 small urban streams (average flow < 1 $m^3 s^{-1}$), most of which serve as part of the sewage system. High hydrological stress and habitats simplification lowers ecological potential and water quality. Compacted historical development reduces water retentiveness in the landscape and destabilizes streams' hydrological patterns.

Some rivers sections (basically those located at the outskirts of the city) have been relatively less degraded, and flow through with the semi-natural open river corridors. Strengthening of channels, highly impermeable surfaces in the city and relatively high slope of stream channels (5-7 ‰) result with high surficial runoff and discharge in the streams. Degradation of freshwater habitats reduces their capacity for water retention and self-purification resulting with low water and ecological quality.

Lodz is equipped with a mix drainage system – combined in the centre, old part of the city and separated in the new, outskirt sections – in general, about 80% of the population has access to the sewer system. Combined drainage system seriously diminishes the efficiency of sewage purification by the Waste Water Treatment Plant during wet weather - the treated sewage from the City are disposed into a small river (the Ner River) of natural flow about 0,3 m3/s, with the average sewage outflow of 2,5 m3/s, and seriously increasing during rainfall. The Ner river floodplain have been severely contaminated with heavy metals and organic compounds. During last years, due to decrease of water consumption in the city, the average river flow and ground water level at floodplain decreased, resulting with mineralisation of cumulated organic matter in aerobic condition and in leaching heavy metals from the soil. Sewage sludge utilization: the Group Waste Water Treatment Plant (GWWTP) produces 70 000 ton of sewage sludge, which causes additional economic and ecological issue.

Explain how the LA was established

Stakeholder engagement strategy

The Lodz Learning Alliance (LA) was launched in May 2006. The membership is constantly growing and starting to influence other projects in the city addressing water issues, sustainable development and spatial planning, restoration and investments. The LA has a wide representation of the city stakeholders and includes members from the national, regional and local levels.

In the four LA Meetings the focus has been on the development of the alliance, co-operation, sharing and communication and creation of the common vision for the sustainable city. Other activities have been held to accompany the LA development process such as an artistic competition, exhibition and a documentation workshop. Numerous publications and presentations such as articles in popular papers, information brochures films and TV broadcasts, local, national and international workshops and conferences have been made.

The first extensive stakeholder analysis was conducted by the LA facilitator in 2007, following the scoping exercise as well as the stakeholder analysis exercise conducted in the LA Development and Facilitation LA workshop meeting in March 2007, in which stakeholders were identified on the neighbourhood, city and national levels.

Regular, active participation in meetings and the project evaluation process, of the LA Lodz organizations indicated as LA Stakeholders in the initial in all the subsequent meetings and discussions has been showing commitment, which was formalized by a letter issued to all the Stakeholders by the Mayor of Lodz in 2007, in which expressing his full support, Mr Kropiwnicki appealed for the Stakeholders to recognize the importance of the SWITCH project in the process of IUWM in Lodz, and in particular to collaborate and share data as well as know-how in all relevant areas. Procedures for monitoring the activities and impacts have been being developed with the first stage being the Learning and Sharing/M&E Workshop held in Ghana in December 2007, after which selected City Objectives for M&E were developed, and will be developed further with the participation of the Lodz Learning Alliance members.

All the LA post-meetings/workshops reports are reviewed and commented on by the LA Members in a participatory manner. The Lodz SWITCH LA has its website as a support platform for communication and easy access to all the documentation regarding the SWITCH project past, current and planned activities.

In January 2008 the Lodz 2038 Visioning and Scenario-planning workshop was held, leading to creating a vision agreed to by all the participants gathering the executive, managerial level of stakeholder organizations on the city and regional levels, as well as a representative of the National level being the Director of the Polish Waterways Chamber of Commerce (see Annex 4 for report and list of participants).

Learning Alliance members goals and aspirations

Marshall's of the Voivodship Office	This office implements/realizes tasks delegated by the central government administration to the regional (Voivodship) administration as formulated in the water law. The office is decision-maker effecting changes in policy and practice, working horizontally with the President of the State Board of Water Management, and through the President of the State Board of Water Management working horizontally with the Minister of Environment . Prepares projects of documents concerning appointment and dismissals of members of the Executive Board and the Executive Board Council of the Voivodship Fund of Environmental Protection and Water Management. In order to protect the water resources of the Łódź province, a few complex projects that are aimed both at stopping the process of degeneration as well as the adaptation of the green areas for recreation and tourism purposes are being realized:- The "Pilica Programme" concerning the conservation of water in the basin in Sulejów, in the upper course of the Pilica river and its main tributaries- its aim is to achieve 1st Class cleanliness in the basin in Sulejów, which is the main source of drinking water for the Lodz population- The "Warta Programme" involving the Jeziorsko Basin, Warta river and its tributaries- it allows to create a balanced economic development of the region, and The "Bzura Programme" which principles and objectives are similar to the above mentioned programmes. As a result of carrying out the "Pilica" and "Warta" programmes, a people friendly area, with high recreational and natural values, and appropriate condition for the conservation of natural

	resources and also for developing tourism in the region will be created. The responsibilities of the Department of Agriculture and Environmental Protection of the Marshall's Office directly or indirectly related to water issues are: inland fishing, geology, environmental protection, water management, waste management and hunting.The Department of Agriculture/ Subdepartment for Fees for Using the Environment of the Marshall's of the Voivodship Office collects and verifies information concerning the amount and quality of the consumed water and the disposed sewage.Other issues within the competencies of the Department of Agriculture directly or indirectly related to water issues are:- collection of the received copies of administrative decisions issued by the Voivod or County Councillors in forwarding copies of decisions stating the height of un-issued fees resulting from the emission of pollutants, consumption of water, and letting out sewage into waters or earth, to the Voivodship Inspector for Environmental Protection- running cooperation in accordance with legal acts regarding the environment- writing the Voivodship report for the Minister of Environment based on the data collected,-dealing with issues of fees for using the environment and problems resulting from it, such as: - with self-government administration organs (such as municipality) as well as revenue offices which aims at pointing at subjects obligated to charge fees for using the environment and setting/defining the environment by these subjects - running databases of the subjects obligated to pay fees for using the environment - informing subjects about their un-issued fees/charges regarding using the environment The Department of Agriculture/ Subdepartment of Geology and Geological Permits deals with: - accepting projects of geological works, collecting geological documentation - keeping data of geological works and controlling these works - preparation of annual report of the amount of metres of the currently designed and carried ,out in the Voivodship of hydrogeological and quantities of groundwater for the keeping balance and statistics of these resources, - issuing opinions of projects of legal acts in the area of geology, mining and environmental protection
Regional Board for Water Management (RZGW) - a. Warsaw – Mid-Vistula catchment	The Regional Bard of Water Management in Warsaw operates in the Water Region of the Mid-Vistula river. Hydrographically, the area belongs entirely to The Balic Sea basin and comprises tributaries of Mid-Vistula (from the mouth of Sanna - 295,2 km as far as Korabniki – 684 km) and Niemen, Pregola, Swieza and Jarft. The area of operation includes the Lodzkie Voivodship The Water Management Councils also called "Regional Councils", are formed with advisory role to the directors of Regional Water Management Boards The Regional Council's role is to express opinions in the field of water management in a region , in particular: 1-designing conditions for using waters in a water region 2-designing conditions of flood protection in a water region 3-designing of water management in a catchment area 4-planned undertakings related to restoration of ecosystems degraded by exploitation of water resources 5-designing of investment related to water management in a water region 6-local and regional administration run plans of waste management A Water Management Council consists of 30 members announced by

	local administration, economic, agricultural, fisheries and community organizations related to water management, by companies using water, and owners of water other than State Treasury, called for a period of 5 years RZGW regulates fees for fishing, fishing licences and permits, issues fishing licences and permits. RZGW is divided into following departments: -Water resources -Flood protection -Maintenance of waters and hydro-technical infrastructure
Regional Board for Water Management - b. Poznan – Warta catchment	The area of operation includes the Lodzkie Voivodship, the region of the RZGW Poznan's operations is the Warta river catchment; Lodz is situated within the Sieradz Inspectorate, Ner is a tributary of Warta river catchment The Water Management Councils also called "Regional Councils", are formed with advisory role to the directors of Regional Water Management Boards The Regional Council's role is to express opinions in the field of water management in a region , in particular: 1-designing conditions for using waters in a water region 2-designing conditions of flood protection in a water region 3-designing of water management in a catchment area 4-planned undertakings related to restoration of ecosystems degraded by exploitation of water resources 5-designing of investment related to water management in a water region 6-local and regional administration run plans of waste management A Water Management Council consists of 30 members announced by local administration, economic, agricultural, fisheries and community organizations related to water management, by companies using water, and owners of water other than State Treasury, called for a period of 5 years RZGW regulates fees for fishing, fishing licences and permits, issues fishing licences and permits RZGW Departments: Water resources Flood protection Maintenance of waters and hydro-technical infrastructure
City of Lodz Office (UML), Department of Municipal Management, Supdepartment of Infrastructure	Issues that the Subdepartment for the Municipal Infrastructure deals with include: - Issuing opinions regarding legal water permits (operaty wodno-prawne) related to rivers located within the administrative limits of the City of Lodz with respect to: a. crossing rivers by pipe-networks, cables, etc. b. discharge of stormwater into rivers, c. determining the level of mounting of water in rivers

	- Giving information regarding project solutions of the municipal water and sewerage network as well as regarding investment on rivers - Giving information regarding using the water and sewerage network as well as rivers - Giving information regarding the location of street springs, public Wells as well as location of water tankers - Co-ordination of the program of small retention, operation and management of the sewage treatment plant in Lodz, sewerage system developments, managing municipal investments The Department manages a project called "Waste water and sewage treatment in Lodz (Phase 1)" co-funded by the EU – a project aiming at sewage treatment and ultimate management of sewage sludge from the whole region treated by the plant with respect to the EU standards. As a result, the river Ner will regain its cleanness, the Warta and Oder rivers will be protected, and through them the Baltic Sea. The project run with the Lodz Infrastructure Company – LSI regarding water and sewage infrastructure. More issuses the Subdepartment is in charge of: Supervision of exploitation of water supply and sewage treatment systems leased to the Lodz Infrastructure Company Ltd. (LSI), supervision and controlling of services regarding the urban water supply and reception of sewage as well as its delivery to GOS LAM as well as controlling of realization of services by Zakład Wodociągów i Kanalizacji Ltd. (ZWiK), ordering and controlling of services regarding ongoing maintenance and use of stormwater, issuing opinions for applications for permits for emptying no-outflow reservoirs and transportations of liquid sewag, creating and running inventory of no-outflow reservoirs, setting costs for repairs of water infrastructure and infrastructure used for removal of waste <u>On-going projects run by the Department:</u> I. Water Management:General Project – City of Lodz Water System – a new groundwater water source for the citizens of Lodz/Strategy for providing water for Lodz in 2004-2020 II. Sewage Management:General Project – Sewerage System for the City of Lodz/General Project for stormwater discharge from the southern and eastern City of Lodz terrains: Olechowka and Augustynowka catchment, Miazga catchment, Jasien catchment, Ner catchment/General Project for stormwater discharge from the northern and western City of Lodz terrains:Jasieniec catchment, Lodka and Balutka catchment, Zimna Woda catchment, Aniolowka catchment, Wrzaca catchment, Sokolowka and Brzoza catchment, Lagiewniczanka catchment, Bzura catchment, Moszczenica catchment/Sewage reception from the City of Lodz terrains not connected to the sewage network 2002-2020 project III. General project for stormwater management in the sewage network of the City of Lodz IV. General Project for the riverso of the City of Lodz: R-1 The Brzoza River/R-2 The Ner river catchment, the Miazga river, the Bzura river/ Z-1 reservoirs The Subdepartment for Infrastructure runs the Small Retention Programme, whose part is realized within/with the SWITCH Project, in the form. the renaturization of the Sokolowka river. The Subdepartment is the prime stakeholder/partner in the implementation of the project.

City of Lodz Office (UML) Department of Environment and Agriculture/Sub-department for Environment, Water Management and Geology	The main responsibilities of the Department include: co-management of infrastructure, rational usage of natural resources and shaping natural environment for sustainable development, management, control and planning of the city's green areas. The issues the department deals with include: air quality protection-related issues, noise protection, legal water-related permits, permits for production, collection, transport, recycling and destroying of waste, approving of dangerous waste management programmes, earth surface protection, i.e. soil quality, integrated permits, decisions regarding environmental conditions for permits for realization of undertakings, conducting research in estimating the impact of undertakings on the environment, designing programmes and issuing opinions for programmes for environmental protection, collaboration on designing a programme for waste management in the city, issuing opinions for studies for conditions and directions for spatial planning as well as local development plans, issues concerning granting licences for search for, recognition and extractions of resources, geological projects and documetation, administration of the Municipal and Communal Funds for Environmental Protection and Water Management, issuing opinions for applications for financial suport by the Voivodship Fund for Environmental Protection and Water Management <u>Subdepartment for Protection of Greek Areas</u> <u>Main Tasks:</u> Granting permits for removal of trees and shrubs as well as their replanting, issuing fines, issuing applications in cases of establishing forms of environmental protection, running inventory of natural monuments, documentation sites, ecological cultivable sites as well as natural landscape complexes, making arrangements for creating landscape parks, issuing agreements for transformation of terrains with old trees, issuing opinions for localization of objects and investments <u>Subdepartment for Maintenance of Green Areas and Agriculture</u> <u>Main Tasks</u>: Supervision of activities regarding maintenance and extension of green areas conducted by municipal units, designing of Project plans and financial plans of the Department as well as the supervised units. Supervision and assessment of the plans by the supervised units, supervision of the correctness of implementation of the tasks conducted by units particularly in respect of forest management, botanic and zoological garden, as well as implementation of budgeted Department tasks as well as objective-bound funds of the Department and supervised units. Conducting cases regarding recultivation of and development of forest grounds, coordination of tasks concerning planting forests in agricultural areas, registration of fishing boats, issuing fishing licences
City of Lodz Office (UML), Departament of Strategy and Analysis	The main responsibilities of the department include: providing of the coherence between the investments projects with the development strategy of the City of Lodz, analyses of socio-economic problems, predictions of development trends, coordination of works on statistical data and databases, provision of strategic goals and directions of

	development in terms of infrastructure investments 1)Subdepartment for Analysis Main Tasks: Co-ordination of activities of departments in order to assure cohesion of economic programmes with the agreed strategy for the city development, conducting periodic analyses regarding city's socio-economic situation as well as predicting developmental trends, preparing materials for the assessment of city's creditability, co-ordination of statistical works carried out by relevant organizational units of the City Office, creating joint reports, collaboration with the Voivodship Statistical Office and other organizations creating databases 2) Subdepartment for the Strategy of City Development Main Tasks: Initiation and co-ordination of work on the project of the strategy of the city development, including defining strategic golas and development directions as well as formulating operational golas for particular socio-economic areas in the city, defining priorities in the fiels of infrastructural investments, conducting the participation of Lodz in „EUROCITIES" – an association of European Cities project 2a)Unit for Revitalization and Long-Term Investment Programmes Main Tasks: creating and coordination of realization of long-term city investment programmes, coordination and monitoring of revitalization-related activities in the area included in the local revitalization programme, conducting of the Unit for Coordination and Assessment of Long-Term Investment Programmes
City of Lodz Office (UML), Department of Spatial Planning and Architecture	The main responsibilities of the department include: elaborating development plans, approving investments location, giving the opinion on solutions to the architecture-related issues on the city level, elaborating development plans, approving investments location, giving the opinion on solutions to the architecture-related issues 1) Subdepartment for Architectural-Building Administration Main Tasks: making decisions regarding the location of public investments as well as the conditions for technical infrastructure, issuing building, demolition and change of use permits 2) Subdepartment for Heritage Protection Main Tasks: issues related to heritage protection including supervision of use conditions, renovation and reconstruction of buildings within the aspect of maintaining their conservation valours as well as protection of heritage Urban sites (in collaboration with the Department of Culture), issues related with the heritage protection, putting them in the hands of heritage caretakers, running an inventory of heritage objects within the city's ownership as well as cultural heritage not enlisted in the heritage register, preparation of conservation-restoration activities as well as running an architectural detail storehouse, issues run by the city's decorator, including issuing opinions regarding artistic/design-related solutions within the city 3) Subdepartment for Urban Planning

	Tasks: making decisions regarding conditions for building and development of investment areas (excluding those local City Office branches are in charge of), issuing copies of local development plans sections, dealing with cases of dividing of land
Office for Spatial Planning of the City of Lodz (Miejska Pracownia Urbanistyczna)	Office for Spatial Planning of the City of Lodz is a unit budgeted by the City of Lodz Office, and its tasks include: 1)creating local spatial development plans for the City of Lodz assessment of validity of the study of the city of Lodz development conditions and directions as well as creating the design of the study and changes to this document 2) creating other urban Project designs connected to the development of the city of Lodz 3)issuing opinions and urban planning directives for other organizational unit sof the City of Lodz Office, conducting the urban planning-related monitoring for the city of Lodz The Sokolowka local development plan is being prepared by the Office for Spatial Planning of the City of Lodz. The Office requested the Director of the European Regional Center for Ecohydrology u/a UNESCO/Director of the ICE PAS to make suggestions to the currently underway study of the city of Lodz development plan regarding the river valleys in Lodz
WFOSiGW – Voivodship Fund for Environmental Protection and Water Management	Responsible to Marshall's of the Voivodship Office fund distributing funds from the collection of fees and fines by the Marshall's of the Voivodship Office to Stakeholders from the Voivodship Environmental Protection and Water Management sector, such as UML
Department of Applied Ecology, Faculty of Biology, University of Lodz/ International Centre of Ecology, Polish Academy of Sciences/ ERCE – European Regional Centre for Ecohydrology under the auspices of UNESCO in Lodz	Need something about the organisation in general rather than just its role in SWITCH i.e. ERCE is an international centre that promotes Ecohydrology i.e. the combined ecological and hydrological management of rivers. In Lodz this offers potential to manage rivers in a more natural way, through better designed urban water features (like flood storage ponds and wetlands) that look better and provide recreational spaces as well as being more sustainable and creating new habitats for wildlife in the city. Activities of ERCE include research and training. The institute provides a key relatively independent nodal function and can bring water stakeholders together. Basic monitoring and ecohydrological research in the 2 demonstration areas - - major issues addressed: water retention in the landscape, water quality, ecological stability, application of ecohydrology system approach for environment improvement, stability and socio-economic feedbacks - adaptations of management and existing/planned infrastructure according to the EH principles
Department of Environmental Engineering, Technical University of Lodz, Subdepartment of Water and Sewage Technology	Quantification of hydrological cycle in the catchments and water supply/demand balance, development stormwater management plans
Department of Geography, University of Lodz, Hydrology and Water Management	Institute of Hydrology (Meteorology) and Water Management (IMGW) operates in support of public sector as well as commercial firms and offers various services and expertise in the field of meteorology and hydrology

Subdepartment/Institute of Meteorology and Water Management	- dynamics of river outflow and groundwater resources, - hydrological relations in Central Poland, - monitoring of water resources and relations in the Lodz suburban areas
Group Waste Water Treatment Plant (GOS)	GOS manage the sole WWTP that serves the city of Lodz. Their main goal is to reduce the pollution through treatment of sewerage from the city, including some stormwater flows, before it is disposed into the River Ner. GOS is an autonomous publicly owned company that is funded through investment by national government, local government (commune), and national and regional (Voivodship) funds for environmental protection and water management. They employ 232 staff. Their interest in SWITCH has been stimulated by a pilot project focused on finding solutions to dispose of sewage sludge. At the moment sludge is landfilled. Experiments are testing alternative disposal to land and the production of willow. GOS may also benefit from restoration of the Sokolowka river because it would help to reduce peak flows that are currently very hard for the plant to handle
Water System and Sewerage System Company (ZWiK) in Lodz	ZWiK is a Limited Liability Company, where the Municipality of Lodz has 100% of the stakes. ZWiK produces about 60mln of cubic meters of water per year and supplies it to two cities – Lodz and Tomaszow Mazowiecki. The company manages over 2000km of water network and almost 1600km of sewage network. Almost all the inhabitants of Lodz have connected access to water obtained mainly form deep wells, and 95% of the inhabitants of Lodz have connected access to the sewerage network. The company produces and provides drinking water for entire Lodz agglomeration and Tomaszów Mazowiecki (60 mln m3 per year). Since 2003 to June/July 2007(time of heavy rainfall) ZWiK collaborated with the Department of the Municipal Management of the City of Lodz Office on the flood-preventive monitoring of rivers as well as agreements on technical documentation on the investments made on rivers. Until now ZWiK has been, on the City of Lodz Office's order, the users of the stormwater sewerage network in the city. As a result of the 2007 heavy rainfalls, the City of Lodz Office ordered ZWiK to conduct the maintenance and repair work on the river beds as well as the stormwater infrastructure in the most affected and sensitive places in Lodz for a sum exceeding 1mln PLZ. It is likely that the City of Lodz Office and ZWiK will undertake steady collaboration again in the future. The activities of the company are controlled by Executive Council and the Stakeholders Assembly (Walne Zgromadzenie Wspolnikow), which on behalf of the Municipality of Lodz is represented by the Mayor of Lodz, Jerzy Kropiwnicki The ZWiK Department of the Production of Water "Lodz" ("Dabrowa" Water Network) is the largest if the three main systems of water supply for Lodz. It has been in operation for over 60 years

	based only on the deep wells located in Lodz and on its outskirts. The "Dabrowa" network also includes: The Water Conditioning Station, where deep water is cleaned; chloring station, where the water undergoes disinfection, a pumping station, which pumps the water further to Stoki, where is distributed based on gravity to the flats and houses in Lodz The deepest well is 901m deep; the well in Bronisin produces 340 cubic meters of water per hour, the time of the water flow from the furthest located wells takes about 6hours. The average ratio of the usage of electric energy for the whole "Dobrowa" network is 0,87 kWh per cubic meter of the obtained and conditioned water. Some other activities that ZWiK performs are: registration of water meters diagnostics and inspection of deep wells
Voivodship Inspectorate of Environmental Protection, Department of Monitoring (WIOS)	The Inspectorate deals with monitoring of the rivers, reservoirs and groundwater in the Lodz Region. Its areas of inspection include: inspections in the organizational units using the environment; the inspection activities by Voivodship inspecotrates are planned and conducted based on the directives by the General Inspector for Environmental Protection and the Voivod, the analysis of the inspections so far as well as suggestions made by administrative organs from all over the Voivodship. On their basis inspection plans are created. The main goal of an inspection is forcing a user of the environment to undertake activities which in consequence will reduce or eliminate their negative impact on the environment, such as reduction of air-pollutants emitted by technological and energy sources, reduction of waste loads in the sewage let out to receivers, elimination letting out of untreated or insufficiently treated sewage waste into lakes and reservoirs, protection of drinking water (re)sources, elimination of cases of improper collection, removal or recycling (including storage) of waste, assessment of fulfillment of environmental protection requirements by inspecting new objects and installations given for exploitation, preventing illegal trans-border transportation of waste The Departament of Inspections also conducts market supervision inspections, i.e. it meticulously supervises the plants and companies particularly harmful to the environment on the country or voivodship scale, and conducts tasks related to the prevention of serious failures including running a database of plants and companies likely to undergo a failure with environmental consequences, inspects those plants and companies with the frequency stipulated by Environmental protection law. On the basis of the results of inspections, the Voivodship Inspektor for Environmental Protection may issue a post-inspection demand, direct an application to other state and local administration organs, issue fines, issue legal case applications in case of breaking the environmental law , issue decisions to stop company's/plant's operation, stop an opening of an object not conforming to the environmental protection requirements
Voivodship Melioration and Water Appliances Company in Lodz (WZMiUW)	Voivodship Executive Bard for Melioration and Water Infrastructure in Lodz is an administrative state-budgeted unit with its seat in Lodz acting in the Lodz Voivodship deals particularly with the following melioration and water management issues: maintenance of basic water infrastructure - structures and equipment, maintenance of waters important for the regulation of water relations for agricultural needs as well as other waters in the ownership rights of the Marshall of the infrastructure, maintenance of the Voivodship Flood Warehouse, management of water grounds and other commodities related to water

	management owned by State Treasury, supervision of the Union of Limited Water Companies (Zwiazki Spolek Wodnych) , running an inventory of waters, water meliorations as well as meliorated grounds, preparation and realization of small retention objects, coordination of activities related to the „Programme for the Vistula and Its Catchment", „Voivodship Pilica Programme", „Programme for the Oder" and other related to water management, participation as a side in the water-law related legal cases regarding Basic melioration infrastructure and waters in the ownership of the Marshall of the Lodz Voivodship, running of documentation agreements regarding waters in the ownership of the Marshall of the Lodz Voivodship as well as water infrastructure, participation in meetings of Teams for Documentation Agreements (Zespoly Uzgodnien Dokumentacji). Other issues dealt with by WZMiUW: service to the Fund for the Protection of Agricultural Grounds, verification of the charges obtained from using the environment, granting permits for exemptions from prohibition within the inland water fishing act, setting or removing enclosures for breeding fish, granting financial aid from the Lodz Voivodship budget to water limited liability companies
Lodz Infrastructure Company, Ltd (LSI, Sp z oo)	Lodzka Spolka Instrastrukturalna, Sp z oo, is a Limited company set up in 2005 with the City of Lodz (Municipality) as the sole stakeholder; the idea to found the company was to establish an entity to manage the city's water-sewerage resources unified with the preferences of the European Cohesion Fund in terms of urban infrastructure management. It was equipped with the water-sewerage resources by the City of Lodz. It collaborates with ZWiK Ltd and GOS Ltd LSI's main activities are: 1.Management of the water-sewerage infrastructure in collaboration with ZWiK and GOS 2.Realization (Implementation) of a EU Cohesion Fund "Water System and Sewerage in Lodz II" project aiming at: - „tidying" of the water-sewerage management system in the City of Lodz through extension and modernization of water-sewerage infrastructure in Lodz. The cost of the project is approx. 142 mln EURO and is a continuation of Phase I of a project called "Sewage treatment in Lodz" co-funded from a pre-access ISPA EU fund. The realization of the project is planned for 2001-2009, and as a result the sewage will be going through the considered most modern waste water treatment plant in Europe – GOS (Group Waste Water Treatment Plant for the Lodz Agglomeration), which will contribute to a substantial improvement of the environment. The Project involves the 8 following tasks related to building works: Task 1 – Modernization of GOS (GWWTP)-LAM Task 2 – Modernization of the water supply system in Lodz Task 3 – Modernization of the distributive water-sewerage network in Lodz Task 4 – Modernization of stormwater system in Lodz Task 5 – Modernization of sewerage network and stormwater infrastructure in Lodz – Phase I Task 6 – Modernization of water-sewerage infrastructure in Al. Wlokniarzy in Lodz Task 7 - Development and extension of water-sewerage network in the urban zone in Lodz for Baluty and Widzew districts Task 8 – Development and extension of water-sewerage network in the urban zone in Lodz for Gorna and Polesie districts 3.Running investments in the field of water and sewerage system

	(modernization of the existing water and sewerage systems, and developing/building new network) 4.Running other investment in the field of urban infrastructure such as: - Lodz KANAL net – Building within the existing and designed water-sewerage system fiber optics network, which will enable the development of the information society - EC1 - Revitalization and adaptation for the cultural and art purposes
Lodz Municipal Services Company (LZUK)	LZUK in terms of UWM manage: 1.Water-sewerage systems-related works - canals and stormwater pools 2. Building and construction works 3. Roadworks 4. Tidying and cleaning of streets, roads, parks and green spaces 5. Electrical works The company was established and started its activities on 1.04.1994 as a Public Works Company with a seat in Lodz formed from the previously operating Public Works Company and Company for Recycling and Storage of Waste in Lodz. Since 1.07.1999 the company has also been managing three communal cemeteries as stated in the City Council Law dated 1.01.2006 – Lodz Municipal Services Company and Zaklad Energetyki Cieplnej Ustronna in Lodz merged, which added the Zaklad Eneretyki Cieplnej (Heating Power Plant) Ustronna activities to LZUK. Currently LZUK deals with activities related directly to the city's need within the Commune's own tasks, particularly: Municipal Waste Management, Management of closed (non-operating) waste dumping areas, Winter and summer city cleaning, Building and maintenance of municipal infrastructure, Maintenance of green areas, Administration of municipal cemeteries, Supplying the end-users with heating, Creating energy from renewable sources. LZUK organized over 650 work positions, owns a concrete production site, specialized machines and vehicles such as street cleaning vehicles , machines for closed waste dumps remediation, diverse building works. LZUK produces natural fertilizers from biological waste.
„Aquaprojekt "	A private company dealing with design of equipment for water construction, melioration and environmental protection, technical concepts development, legal water management -related operational documentation for properties , assessment of environmental impact, architectural design. In SWITCH, in collaboration with scientists and the Subdepartment for Infrastructure of the City of Lodz Office, they design the reservoirs in the renaturization of the Sokolowka river.
Lodz Destination Alliance	"The Lodz Destination Alliance was formed and developed as a nonprofit foundation, by a group of leading institutions and companies of Lodz in 2005. The LDA is a voluntary member association. The key idea is to unify all Lodz's institutions, which are and would like to take an active part in the process of creation of the brand name of our city. The LDA's goal is to develop Lodz as preferred destination for business and leisure tourism as well as a perfect spot for conferences

	and meetings." The LDA builds upon the experiences of the Warsaw Destination Alliance (to promote Warsaw) and some of the same founding members are involved. Focusing on economic and cultural development the LDA encourages (external) investment in Lodz working closely with foreign chambers of commerce and companies to encourage investment in business in Lodz, and with media (e.g. a recent advert on the BBC) to promote the city as a cultural destination. They organize relevant events and in 2007 they organized two important conferences on 'Lodz: the city of success' and 'Revitalization and current trends in architecture'. SWITCH were invited to present at this later conference on the role of water to create city environments that are more attractive to investors. They are also interested in corporate social responsibility e.g. child welfare. As well as being interested in the end point of a cleaner more attractive city, the LDA could potentially give useful publicity to SWITCH and help to disseminate successful experiences to encourage them to be scaled up.
NUDNO	Student Association, with strong interest in ecology helping to "spread the word" about the SWITCH project in Lodz, which produced an exhibition with the patronage of SWITCH called "The Lodz Rivers", displayed at the Piano Café in May 2007 as well as during the Process Documentation Training at the Public Presentation in the Gallery of the City of Lodz Office's Promotion Office on 5.07.07
Eko-Kom Ltd.	EKO-KOM® Sp. z o.o. (EKO-KOM® Limited Liability Company) EKO-KOM® was established 2002 in Lodz, and are a member of a group of agriculture companies with 14 years of experience, knowledge and expertise in the field of growing willow plantations. Their 70 hectare breeding plantations of Salix viminalis clones originate from Lydum Energy Planter located in Denmark. During their activity they have sold a few millions of 22 cm long willow cuttings (seedlings), appearing to be one of the largest manufacturers and suppliers of willow cuttings on the Polish market. Their activity is not only limited to simple sales of cuttings but they are focused on the development of large-scale industrial plantations of willow. In spring 2007 they started to establish a high yielding plantation over large areas (approx. 500ha). In order to achieve this goal EKO-KOM® has established another two companies ECO-PLANT and ECO-SKOG. They have enough resources to effectively carry out all necessary agriculture works and finally supervise existing plantations. Besides the seedlings core business EKO-KOM® takes part in various bio - engineering projects, such as: Willow energy plantations, Technical infrastructure and mechanization of all stages of yielding, processing and burning biomass; central heating systems and installations. Ecological water treatment systems (SWITCH), Buffer zones of willow around water reservoirs, waste filtration. Buffer zones of willow around sites that produce pollutants, like refuse dump, areas degraded by industry and army. Soil building and land reclamation, river bank stabilization, etc. Advocacy and support in achieving financial donations from environmental ecological funds using our ongoing contacts
SP (Primary School) no172,	Educational Path Design and Testing, Ecological Education in

Junior High School no 15	Collaboration with the SWITCH Lodz researchers and educators
ZSS no 8, SP no 111, Secondary School no 22, School for Children with Seeing Disabilities, LO (High School) no 47	Participants of the SWITCH Lodz LA "Water in Lodz – the City of the Future Art Competition" – schools with curricula or extra-curricular activities dedicated to ecological education, particularly involving water

Overall LA objectives

The role of the LA will be to develop efficient mechanisms to ensure that:

i) Research is demand led and well fits the city and local needs and conditions;

ii) Results of the research are put into use;

iii) Research influences policy in IUWM .

The LA will make sure to achieve the above by building partnerships and networking in order to ensure widely participation of different actors and organizations, and facilitating vertical and horizontal information flow and exchange based on a combination of methods and all aiming to scale up local innovations.

Achievements to Date

Appointment of the SWITCH LA Team and Trainings:
Prof. Maciej Zalewski was employed as Project Mentor, Dr Iwona Wagner as city coordinator and Monika Dziegielewska-Geitz as city Learning Alliance facilitator.

The trainings which the LA core and other Support Team members – Katarzyna Izydorczyk, Kinga Krauze, Aleksandra Skowron and Agnieszka Jaszczak of the University of Lodz/ERCE ua UNESCO took part in were:
1. LA Development and Facilitation, including Stakeholder Analysis (January 2007, Cairo), participants: Monika Dziegielewska-Geitz, Agnieszka Jaszczak
2. Social Inclusion (March 2007, Delft), participant: Monika Dziegielewska-Geitz
3. LA Development and Facilitation (March 2007, Lodz), Lodz LA Core & Support Team
4. Process Documentation (July 2007, Lodz), Lodz LA Core & Support Team
5. LAs Learning & Sharing/Participatory Monitoring and Evaluation (December 2007), participant: Monika Dziegielewska-Geitz

Setting-up, mapping stakeholders and formalizing the vision of the Lodz LA
Mapping stakeholders

The first extensive stakeholder analysis was conducted by the LA facilitator in 2007, following the scoping exercise as well as the stakeholder analysis exercise conducted in the LA Development and Facilitation LA workshop meeting in March 2007, in which stakeholders were identified on the neighbourhood, city and national levels. Second draft report submitted in February 2008.

Formalisation of the vision and organisation of the Lodz LA
Awareness of the SWITCH project and objectives has been being developed through the four main LA meetings (May 2006 Scoping Meeting, January 2007 Stormwater & DSS System Meeting (Annex 3), March 2007 LA Development and Facilitation Meeting (Annex 2), January 2008 Visioning Workshop as well as through additional actions, such as a public presentation of the Process Documentation Training outputs, directed to the Lodz LA Stakeholders, media partners and the society, on July 5th 2007.

Regular, active participation in meetings and the project evaluation process, of the LA Lodz organizations indicated as LA Stakeholders in the initial in all the subsequent meetings and discussions has been showing commitment, which was formalized by a letter issued to all the Stakeholders by the Mayor of Lodz in 2007, in which expressing his full support, Mr Kropiwnicki appealed for the Stakeholders to recognize the importance of the SWITCH project in the process

of IUWM in Lodz, and in particular to collaborate and share data as well as know-how in all relevant areas. Procedures for monitoring the activities and impacts have been being developed with the first stage being the Learning and Sharing/M&E Workshop held in Ghana in December 2007, after which selected City Objectives for M&E were developed, and will be developed further with the participation of the Lodz Learning Alliance members.
All the LA post-meetings/workshops reports are reviewed and commented on by the LA Members in a participatory manner. The Lodz SWITCH LA has its website as a support platform for communication and easy access to all the documentation regarding the SWITCH project past, current and planned activities.

In January 2008 the Lodz 2038 Visioning and Scenario-planning workshop was held, leading to creating a vision agreed to by all the participants gathering the executive, managerial level of stakeholder organizations on the city and regional levels, as well as a representative of the National level being the Director of the Polish Waterways Chamber of Commerce (see Annex 4 for report and list of participants).

Documentation of the LA Lodz process
Process documentation which serves as the record for the innovation process has been conducted through recorded and shared observations from meetings, meeting reports including photographic recording, videos, films, process documentation workshop outputs (video, writing, photography), newspaper articles, brochures, emails, recorded meeting and workshop presentations, and the LA website (see the city website for the documentation outputs)

Dissemination & Communication
Dissemination has been being done though the Lodz LA website established in March 2007, e-mails, actions such as a public presentation of the outputs of the process documentation training workshop at the City of Lodz Office's Bureau for the City Promotion of International Cooperation, and an artistic competition "Water in Lodz – the City of the Future" with the public presentation for laureates in October 2007, photo exhibition "The Rivers of Lodz" organized together with the students' association called NUDNO at the Piano Cafe in May-June 2007, radio interviews, newspaper articles, public presentations, and publications

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Relationship of demonstration activities to LA – evidence of demand:

The Lodz City demonstration project has proven to be demand driven. The issues related to stormwater retention and purification has been identified by the City of Lodz Office and citizens as highly desired, already a long time ago. The activities developed in the demonstration projects of SWITCH are concordant with regional programmes for urban water management, implemented by the City of Lodz Office for the last several years, and has been enriched by the SWITCH programme, as a natural demand driven extension. Moreover, following the results of the social research conducted early this year by the social research company (February, 2006), developing of the social space in the city, including open water and green recreational areas, were considered to be of key importance for the Lodz citizens. These areas proved to develop more dynamically and be of greater interest as residential areas.

The idea of both demonstration projects (Ner and Sokolowka Rivers) has met with a great interest and support of the the Learning Alliance members, forming the group in the first phase of its establishment and development. Ensuring the efficient implementation of the research results on the demonstration sites, the LA Group has been gradually extended with the members directly related to the activities on these two sites, including the water resources managers, owners, user and society.

SWITCH in the City – Relationship to Workpackages

The research and demonstration activities take place in two demonstration areas of the city – the Sololowka and Ner rivers, with the potential to be up-scaled to other areas in Lodz, region and countrywide. They aim is developing the scientific basis, validation and assessment of the effects of application of ecohydrology approach in cities in order to mitigate the identified water pressures and issues, increase the quality of life (e.g., flood protection, access open water) and health (e.g., reduction of toxic algal blooms, allergies, asthma) of the city inhabitants, increase cost-efficiency of the IUWM and provide new opportunities for the society.

The major challenges related to the identified issues and water pressures are the following:

- adaptation of city rivers and catchments for interception of large stormwater and pollution loads;

- elaboration of comprehensive concept of wastewater treatment plant management addressing issues of sewage sludge utilization, biomass production, and river rehabilitation;

- increase of the quality of life for the city inhabitants;

- providing socio-economic feedbacks to the city inhabitants based on use of ecosystem resources of regenerated urban ecosystems;

- Integration of stakeholders for capacity building, improved governance and efficient decision making for IUWM (LA);

The research addresses tasks related to the above challenges and involve so far 9 working groups, involved in the following aspects:

1. Analysis of the water cycle
2. GIS and topographic documentation
3. Global Climate Change
4. Ecotoxicology
5. Phytoremediation and Bioenergy
6. Landscape analysis
7. Ecohydrology and Urban Aquatic Ecosystems
8. Health
9. DSS and flexible adaptation strategies for IUWM in Lodz

These activities are related to the following SWITCH WPs:

WP 0.2: Dissemination and Training
WP 1.1: Development of strategic approach and of indicators for sustainability and risk assessment
WP 2.1 Technological Options for Stormwater Control under Conditions of Uncertainty
WP 2.2 Decision-making processes for effective urban stormwater management Uncertainty
WP 5.3: Maximising the use of natural systems in all aspects of the municipal water cycle
WP6.2 Learning alliances LAs
WP6.3 Optimising Social Inclusion

SWITCH Demonstration activities

The goal of demonstration activities is to demonstrate application of Ecohydrology as an integral and essential part of the sustainable Integrated Urban Water Management. Demonstration activities take place in two projects/areas:

Project 1: Sokolowka river - Restoration of a municipal river for stormwater management, increase of water retentiveness and improvement of quality of life;

Project 2: Ner River - Sewage system management for environment quality and positive socio-economic feedbacks

The potential impact of the demonstration activities are:

- construction of 2 new reservoirs reduction of stormwater peaks;
- adapting hydrotechnical infrastructure in the new and old reservoirs to ecohydrology principles – reduction of stormwater peaks and improvement of the quality of water in the Sokolowka system;

- ecological restoration of a Sokolowka river section and elaboration of recommendations for replication in other Lodz rivers;
- supporting development of green areas in the river catchment based on hydrological regulation;
- development of operational procedures for the WWTP, including ecological and economical goals;
- elaboration of the DSS for the WWTP sewage sludge utilization and biomass production;
- increase of the amount of green energy production;
- increase of the environmental awareness by using the on-line permanent monitoring systems for environmental education;
- creation of preliminary meta-data base enabling easy access to main environment-focused information;
- active involvement of society in environment enhancement and building of new image of the city;
- Better integration of stakeholders for capacity building, improved governance and efficient decision making for IUWM (LA);
- Replication of the gained experiences to other rivers in Lodz, region and countrywide;

Linkages of SWITCH with other regional/city water initiatives

The activities developed in the SWICTH project are concordant with the programmes for urban water management, implemented by the City of Lodz Office, mainly by those co-ordinated by the Department of Municipal Management of the City of Lodz office. Recently, the University of Lodz and the European Regional Centre for Ecohydrology has been invited to cooperation on the development of the city spatial development plan regarding the river corridor and protection, which opens a wide possibility for implementation of the EH solutions on the wide city scale.

Activities for Months 13-30 and planned activities from Months 25-42

Summary of the main points/focus of SWITCH activities in Months 13-30

Research activities:

- Literature review on the use of natural systems in urban water management;
- Continuation of the monitoring of the Sokolowka River for the purpose of elaboration of the rehabilitation plan, including:
    1. Analysis of the water cycle and hydrological regime;
    2. Monitoring of physical and chemical parameters;
    3. Identification of anthropogenic contaminations in the catchment;
    4. Analysis of ecohydrological processes by application of nucleic acid;
    5. Evaluation of fish resources;
    6. Monitoring of phytoplankton composition in reservoirs.
- Continuation of the research on the willow plantations and development of the conceptual mathematical model for the sewage sludge management and biomass production in the Waste Water Treatment Plant;
- New topics:
    1. Comparative analysis of dioxin and dioxin-like compounds in sediments from different anthropogenic impact reservoirs in the Sokolowka river;
    2. Landscape analysis: Plant - water interplay in urban river valley – identification of hot-spots for river rehabilitation;
    3. Use of stabilized sewage sludge in the deciduous ornamental shrub production;

Demonstration activities:

Sokolowka river:

- Continuation of works at the Teresa Reservoir (constructed in 2006): Development of the protective vegetation belt (including ecotone zones) around the reservoir and island;
- First stage of the construction of the Zabieniec reservoir –project documentary;
- Hydrological monitoring of the Sokolowka River: Installation of the online monitoring system for research, education and demonstration;
- Development of the mathematical model of stormwater runoff in the Sokolowka River catchment;

Ner River:

- Exploitation of the existing willow plantation (70 ha) and establishment of new patches in the protective zone of the WWTP;
- Elaboration of the conceptual mathematical model for the sewage sludge management and biomass production in the GWWTP (06.2006/model documentation);

Learning Alliance activities:

- Trainings for the LA facilitators and LA members;
- Stakeholder Analysis;
- Consolidation, integration and structuring of the LA Lodz SWITCH Group;
- Dissemination of the LA concept and activities (blog, informative material, exhibitions, competitions for schools);
- Visioning for the City of the Future – Lodz 2080;

Summary of the main points/focus of SWITCH activities in Months 25-42

Activities to Month 42

Learning Alliance

Activity	Specific objective	Task	Deliverables	Due Date
City level communication	To strengthen linkages between the LA members, ensure the exchange of information on the project progress	Task 4c City level communication		ongoing
SWITCH Lodz website development and maintenance	To improve and speed up the communication, information and documentation about the project	Task 4c City level communication		December 2008
Process documentation	To measure the progress of the project against the LA objectives and measure the behavioral change in the approach to management	Task 4b Monitoring and process documentation at city level		ongoing
M&E – quarterly reports	To measure and evaluate the progress against specific objectives, build awareness about the existing needs and existing gaps related to the realization of the objectives	Task 4b Monitoring and process documentation at city level		III 2008 VI 2008 IX 2008 XII 2008 III 2009 VI 2009
1-day Scenario-planning workshop * Delivery depends on the availability of an expert from WP 1.1/IRC/IHE	To create scenarios as a follow-up after the visioning workshop according to the visioning methodology provided by SWITCH	Joint with WP 1.1		April 2008
Towards Lodz Restoration Economy	To disseminate information about the			April 2008

2013 Exhibition	SWITCH project in Lodz and other cities, its progress, linkages to restoration and revitalization processes in Lodz emphasizing SWITCH Lodz being a champion in terms of integrating management on the example of IUWM;			
Workshop on Natural systems use: costs covered from	To revise the recent state of knowledge about natural systems use, and produce a plan for a day-to-day use in Lodz	Task 4a Coordinating action research		June 2008
1-day Strategies-planning workshop *Delivery depends on the availability of an expert from WP 1.1/IRC/IHE	To create strategies as a follow-up after the visioning workshop according to the visioning methodology provided by SWITCH	Joint with WP 1.1		September 2008
Half-day workshop on linking research and demonstration to LA	To strengthen linkages between researchers and practitioners within the SWITCH project, to validate the aspect of the research being demand-led	Task 4a Coordinating action research		December 2008
Thematic subgroups meetings	To ensure communication and integration within thematic subgroups and action-lanning	Task 4a Coordinating action research		ongoing
Support/Consulting by scenario-building, strategies &planning experts	To ensure that the methodology is applied correctly and delivered professionally; to lead to a development of a plan related to the vision, scenarios and strategies	Joint with WP 1.1		December 2008
Paper on process documentation	To report on process documentation activities and reflect on the process and the outcomes of the application of particular documentation tools	Task 4b Monitoring and process documentation at city level		March 2009
Half-day workshop for all LA members – Linking the research and policy	To share information and integrate the LA with particular focus on integrating research and policy	Task 4a Coordinating action research		June 2009
Field trips to demo sites for LA members	To show the LA members the demonstration sites,	Task 4a Coordinating action research		June 2009

	inform them and integrate them into the processes occurring there			

Training

Training activity	Purpose	Target audience
Training in financial analysis & fund-raising		
Learning and sharing workshop	To share experiences on implementing LAs across SWITCH	All cities

Dissemination

Dissemination activity	Purpose	Target audience
Leaflet about LA activities (in polish)	Dissemination of information about the LA concept and activities	stakeholders
Creation of "educational path" on the Sokolowka River	Dissemination of ecohydrology as an integral element for the IUWM, awareness rising	General public, schools
SWITCH Lodz website development	LA and City/SWITCH activities dissemination	General public
Towards Lodz Restoration Economy 2013 Exhibition	LA and City/SWITCH activities dissemination	stakeholders
Report on participation in other conferences	LA and City/SWITCH activities dissemination	General public, other cities

Budget summary – Workpackage 6.2: Learning Alliance Activities

			Actual costs (2006/2007), Planned costs (2008, 2009, 2010)					
Year	**Funds Available (total)**	**Funds Used (total)**	**Staff costs**	**LA meeting / event costs**	**Local costs & other expenses**	**LA training costs (travel and expenses for participation)**	**Total Funds Remaining/ Required (EUR)**	
2006	**13 400**[1]	**1 564**	1 051	0[3]	512	0	**11 836**	• 11 836 euros is the r
2007	**24 500**[2]	**17 357**	10 961	0[4]	596	5 798	**7 143**	• 7 143 euros (remaini 2006) makes 18 979
2008	**18 979**	**1 800**[4]	11 500 500[4]	4 500 1 300[4]	11 000	8 000	**- 17 821**	• 1 800 euros – costs c 19; • 4500 euros - 1-day S planning workshop, w from WP 5.3, 1 half-c subgroups meetings, demonstration to LA, • 11 000 euros: Websi development, mainte Conference/worksho Restoration Economy SWITCH achievemer participation in extern members; • (Estimated costs: **36 18 979** euros) = **17 8**
2009	**0**	**0**	13 000	3 000	9 500	8 000	**- 33 500**	-estimated costs
2010	**0**	**0**	13 000	3 000	6 000	8 000	**- 30 000**	- estimated costs

[1] *funds planned for M 1-18;*

[2] *funds planned for M 19-30;*

[3] *costs of all meetings covered by the City of Lodz Office and the European Regional Centre for Ecohydrology under the auspices of UNESCO;*

[4] *staff costs and LA meeting costs (visioning workshop – January 2007) spend in 2007 and booked in 2008financial statement;*

Major achievements

1. Scenarios and strategies for ecohydrology in IUWM in Lodz (jointly with the WP 1.1);
2. Plan for the use of Natural Systems in Lodz (jointly with the WP 5.3);
3. Improved integration and communication of the LA members;

4. Full validation and integration of the city needs and the SWITCH research and demonstration activities;
5. Social aspects incorporated into the Demonstration City through situational analysis and baseline study;
6. SWITCH Lodz Website;
7. Leaflets & promotional materials;
8. Dissemination of the SWITCH LA concept as innovative approach for IUWM in cities in Poland;

Training and support needs

See above:

Learning and sharing workshop under wp6.2, participation of 2 people, expected each year

Financial

Longer Term LA Sustainability

How can learning alliance activities be sustained in the city in the medium to long term? Have any local sources of LA funding or in-kind support been identified?

In 2006 and 2007 the City of Lodz Office and the European Regional Centre for Ecohydrology under the auspices of UNESCO have substantially contributed in-cash and in-kind to organising workshops and meetings for the LA. However these funds on its own would not be sufficient in sustaining the LA activities on satisfactory level at this stage of its development. Support of the LA for the remaining time of the project would be crucial, in order to strengthen the consolidation within the group as well as the position of the LA group in the city decision making process. In order to increase the chances of the LA sustainability, there is a need for organising a fund rising training for the LA members.