

# International Conference

## Water, Megacities and Global Change

**UNESCO – ARCEAU IdF  
Paris, 2 December 2015**

# **MEGACITIES ALLIANCE FOR WATER AND CLIMATE**

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We, stakeholders (citizens, local officials, government representatives, public and private actors in large cities of the world, representatives of international and scientific organisations, including non-governmental organisations), meeting together in Paris from 1 - 4 December 2015 at UNESCO HQ for the international conference on "*Water, Megacities and Global Change*" shall begin by voicing our hope that, on the matter of climate change mitigation, Paris Conference of the Parties at the 21<sup>st</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change achieves the most ambitious agreement on reducing greenhouse gas emissions. This because ***climate change is water change and water is a key resource for the sustainable development of megacities and a key factor of their resilience.***

We, involved in the management and knowledge of water in megacities, are addressing to the 21<sup>st</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change the following strong messages to become into action.

### **Call for action**

Water is an integral part of the post-2015 development agenda and of the Sustainable Development Goals, is playing a key role in improving health and living conditions of the most vulnerable populations.

Climate change – the consequences of which are already foreseeable – significantly affects the water cycle in different regions of the planet and in different ways: rising sea levels, rainfall and temperature changes and more frequent extreme weather events: rain, longer droughts, heat waves, changes in water availability in terms of quality and quantity, among others. These consequences may sometimes occur simultaneously. Due to the intensification of hazards, Megacities and large urban areas are becoming more and more vulnerable. Inappropriate urban planning and construction, concomitantly with climate change, will also increase this vulnerability.

**By 2030, over a billion people will live in just a hundred or so very large cities and 60 % of the World population will live in urban areas. The question of water and hydro-ecosystems management in these urban areas is already particularly complex, considering their sheer size, their spatial extension and rapid development, their complex methods of governance as well as their social heterogeneity especially in suburban areas which gather of the poorest dwellers but with limited infrastructure**

**Water management in these Megacities and large urban areas will only become more challenging in the face of climate change, making their population even more vulnerable.**

Effects of climate change are various depending on each region

- They will be felt through **greater rainfall and increasing flood hazards**. Whether **flood events** are local or begin upstream of the catchment areas, their impact on **cities will become ever more vulnerable** in terms of their impact on the economy and human lives impact. In coastal Megacities and large urban areas, this vulnerability will be exacerbated by rising sea level, and sometimes subsidence caused by excessive groundwater extraction;
- They will be felt through **longer periods of drought with rising temperatures**. This may lead to dwindling water resources, particularly for use by the population – right at a time when demand is due to rise – as well as a greater sensitivity of aquatic environments to pollutant discharges. If we are to provide the necessary level of service to protect populations from such hazards, water shortages must be managed in a way that could prove particularly complex, but which also risks fomenting or aggravating regional tension;
- **They will also affect catchment areas** — in which these Megacities and large urban areas are based. These must therefore be considered hand in hand with their whole area and their surrounding territories, where they go to get their water, to stock up on their food staples, necessary materials and energy supplies. The chronic upheavals and disasters mentioned above will have a major influence on such trade.
- **Unless proactive and concrete measures are taken, the poorest members of our societies will suffer the most – above all from the effects of inadequate water management related to public health concerns**, resulting in more deeply entrenching existing socioeconomic disparities and inequalities. For these reasons, the implementation of the necessary principles of equity with regards to access to water and sanitation for all, and to protection against flooding, especially regardless of social origins should be one of the foundations of urban water management.

### **Supporting and Implementing Water and adaptation to climate change**

**We support resilience and adaptation in water management (drinking water, sanitation, flood control, water resources protection and their allocation between catchment stakeholders) in megacities and very large urban areas to be taken on board of the Climate Change political international agenda, especially the future Conferences of the Parties.**

#### **Considering:**

- That adaptation will require the development of sustainable, innovative solutions and the setup of funding solutions involving international solidarity, not just at a State level, but also at megacity level;

- That Megacities and large urban areas size particularly gives them a potential for technical, organisational or institutional innovation on the basis of:
  - The research and engineering potential they harbour;
  - The political action plans developed worldwide to adapt to and mitigate the effects of climate change;
  - The involvement of citizens' associations which help to develop and bring about local solutions and are effective intermediaries with the population to inform, educate and raise awareness about the challenges of water and climate change;

We believe that it is in the common interest to encourage dialogue to speed up the implementation of sustainable measures aimed at adapting to or mitigating the effects of climate change in the area of water in Megacities and in large urban areas. These measures should be based on local solutions and on based on local know-how.

**To this end, together with the relevant International Institutions in this area, we commit to setting up a cooperation platform, within two years, for dialogue on adapting to or mitigating the effects of climate change related to water in megacities.**

**Therefore a Task Force under the auspices of UNESCO-IHP will be set up in 2016 to provide the preliminary conditions for the emergence of this platform. The Task Force will collaborate with UNESCO water family actors. ICLEI, local governments for sustainability is a partner of this initiative. ICLEI will support the platform ensuring the inclusion of the initiative into the existing reporting platform of local and subnational government climate action (Transformative Actions Program (TAP) – a global initiative to improve access to capital flows to cities and regions; the carbonn Climate Registry (cCR) – the global reporting platform for local and subnational governments on climate action; and the online Solutions Gateway for local governments).**

The main objective of this platform will be to build solidarity and exchanges of expertise's, so as to enhance capacity building between megacities regarding their adaptation to climate change in the water sector in terms based on local solutions. These objectives will include:

- collecting data at a worldwide scale about strategies and results developed by local authorities and their water operators;
- developing experience sharing between academics and operators and improving adaptation through best practices assessments;
- identifying the means and mechanisms for funding the adaptation of megacities to the impacts of climate change on urban water;

This platform will report its activities by:

- raising awareness on water and megacities to an international level, by promoting cross sector participation in different forums of debate and international conferences, focusing on climate change, water, or human settlements;
- organising every three years an international conference on water in megacities, to update knowledge and review progress made both in research and operational terms. It could also enable the monitoring from COP to COP of the post-2015 commitments made in Paris at the COP 21.

**In order to implement the Lima Paris Action Agenda and** without further delay, a certain number of megacities are already committing to launch measures aimed at adapting to or mitigating the impacts of climate change. The lists of megacities and their measures are annexed to this declaration.

Attachments:

List of megacities (including ICLEI megacities) and their mitigation and adaptation actions addressing water.

# Conférence Internationale

## Eau, Mégapoles et Changement Global

### ALLIANCE DES MEGAPOLES POUR L'EAU ET LE CLIMAT

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Paris, 2 Décembre 2015

UNESCO – ARCEAU IdF







Nous, acteurs de l'eau (citoyens, élus locaux, représentants gouvernementaux, acteurs publics et privés des grandes villes du monde, représentants d'organisations scientifiques et internationales, d'organisations non gouvernementales), réunis ensemble à Paris du 1<sup>er</sup> au 4 décembre 2015 au siège de l'UNESCO pour la conférence internationale « Eau, mégapoles et changement global » exprimons en premier lieu notre espoir que, sur la question de l'atténuation du dérèglement climatique, la 21<sup>ème</sup> Conférence des Parties de la Convention cadre des Nations Unies sur le dérèglement climatique, réunie à Paris, parvienne à l'accord le plus ambitieux sur la réduction des émissions de gaz à effet de serre. Ceci parce que « **le dérèglement climatique c'est le dérèglement du cycle de l'eau** »<sup>1</sup> et que **l'eau est une ressource clé pour le développement durable des mégapoles et un facteur clé de leur résilience.**

Nous, impliqués dans la connaissance et la gestion de l'eau dans les mégapoles, nous adressons à la 21<sup>ème</sup> Conférence des Parties de la Convention cadre des Nations Unies sur le dérèglement climatique, les messages suivants, à transformer en actions.

### **Appel à l'action**

L'eau fait partie intégrante des « Objectifs du millénaire pour le développement et l'après 2015 » et joue un rôle clé dans l'amélioration de la santé et les conditions de vie des populations les plus vulnérables.

Le dérèglement climatique - dont les conséquences sont déjà prévisibles - affecte de manière significative le cycle de l'eau sur l'ensemble de la planète et de différentes manières: hausse du niveau de la mer, modification des précipitations et hausse des températures, augmentation des fréquences des événements météorologiques extrêmes: entre autres : pluie, épisodes de sécheresse, vagues de chaleur, réduction de la disponibilité de l'eau en quantité et qualité suffisantes. Ces conséquences peuvent parfois se produire simultanément. En raison de l'intensification des risques, les mégapoles et les grandes zones urbaines sont de plus en plus vulnérables. Un urbanisme et des constructions inadaptés, en concomitance avec le dérèglement climatique, vont également augmenter cette vulnérabilité.

**En 2030, plus d'un milliard de personnes vivront dans une centaine de très grandes villes et 60% de la population mondiale vivra dans des zones urbaines. La question de la**

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<sup>1</sup> « Climate change is water change »

**gestion de l'eau et des hydro-écosystèmes dans ces zones urbaines est déjà particulièrement complexe**, compte tenu de leur taille, de leur extension spatiale et de leur développement rapide, de leurs méthodes complexes de gouvernance ainsi que de leur hétérogénéité sociale, en particulier dans les zones périphériques qui rassemblent les habitants les plus pauvres, souvent avec une infrastructure limitée.

**La gestion de l'eau dans ces mégapoles et les grandes zones urbaines deviendra de plus en plus difficile dans le contexte du changement climatique et rendra leurs populations encore plus vulnérables.**

Les effets du dérèglement climatique seront différents selon les endroits :

- Ils pourront induire de **plus grandes précipitations qui accroîtront les risques d'inondation**. Que ces inondations soient locales ou concernent l'amont des bassins versants, elles rendront les villes de plus en plus vulnérables en termes d'impact sur l'économie, les biens et les personnes. Dans les mégapoles côtières et les grandes zones urbaines, cette vulnérabilité sera amplifiée par la montée du niveau de la mer, et parfois la subsidence causée par les prélèvements excessifs d'eaux souterraines;
- Ils pourront causer **des périodes de sécheresse plus longues en raison de la hausse des températures**. Cela pourra conduire à la diminution des ressources en eau, notamment pour l'alimentation en eau des populations – précisément à un moment où la demande croît - ainsi qu'à une plus grande sensibilité des milieux aquatiques vis-à-vis des rejets de polluants. Pour assurer le niveau de service nécessaire pour protéger les populations contre ces risques, la pénurie d'eau devra être gérée d'une manière qui pourrait se révéler particulièrement complexe, et qui pourrait risquer aussi de fomentier ou d'aggraver des tensions régionales;
- **Ils affecteront également les bassins versants** dans lesquels ces mégapoles et les grandes zones urbaines sont situées. Celles-ci doivent donc être considérées dans une vision globale intégrant l'ensemble de la région qu'elles impactent, où elles vont chercher leur, d'où provient leurs produits alimentaires de base, les matériaux nécessaires et des approvisionnements énergétiques. Les bouleversements chroniques et les catastrophes mentionnés ci-dessus auront une influence majeure sur ces échanges.
- **En l'absence de mesures concrètes et volontaristes, les membres les plus pauvres de nos sociétés seront ceux qui souffriront le plus – en particulier des effets d'une gestion inadéquate de l'eau vis-à-vis des préoccupations de santé publique**. Il en résultera un accroissement des disparités et inégalités socioéconomiques existantes. Pour ces raisons, la mise en œuvre des principes nécessaires d'équité en matière d'accès à l'eau et à l'assainissement pour tous, à la protection contre les inondations, et tout particulièrement indépendamment des origines sociales doit être l'un des fondements de la gestion des eaux urbaines.

## **Soutenir et mettre en œuvre l'adaptation au dérèglement climatique**

**Nous soutenons la mise à l'ordre du jour de l'agenda politique international sur les dérèglements climatiques, en particulier les futures Conférences des Parties des questions relatives à la résilience et à l'adaptation de la gestion de l'eau (alimentation en eau, assainissement, contrôle des inondations, protection des ressources en eau et de leur répartition entre les acteurs impliqués) dans les mégapoles et les très grandes régions urbaines.**

### **Considérant que:**

- cette adaptation nécessitera le développement de solutions durables, innovantes et l'installation de solutions de financement impliquant la solidarité internationale, non seulement au niveau des états, mais aussi au niveau des mégapoles;
- la taille des mégapoles et des grandes zones urbaines leur donne tout particulièrement un potentiel d'innovation technique, organisationnelle ou institutionnelle en raison :
  - du potentiel de recherche et d'ingénierie qu'elles abritent;
  - des plans d'action engagés par les pouvoirs politiques locaux dans le monde entier pour l'atténuation des et l'adaptation aux effets du dérèglement climatique;
  - de la participation de la société civile qui contribue au développement et à la production de solutions locales et qui constitue un lien efficaces avec la population pour informer, éduquer et sensibiliser sur les défis de l'eau et du dérèglement climatique;

Nous affirmons qu'il est dans l'intérêt commun d'encourager le dialogue pour accélérer la mise en œuvre de mesures durables visant à adapter ou d'atténuer les effets du dérèglement climatique dans le domaine de l'eau dans les mégapoles et les grandes zones urbaines. Ces mesures doivent être développées localement, en utilisant les savoir-faire locaux.

**À cette fin, en collaboration avec les institutions internationales compétentes dans ce domaine, nous nous engageons à mettre en place une plate-forme de coopération, dans les deux ans à venir, pour instaurer le dialogue sur l'adaptation aux et l'atténuation des effets du dérèglement climatique liés à l'eau dans les mégapoles.**

**Pour cela, un groupe de travail sous l'égide de l'UNESCO-PHI sera mis en place en 2016 pour fournir les conditions préalables à l'émergence de cette plate-forme. Le groupe de travail collaborera avec les acteurs de la « water family » de l'UNESCO. ICLEI, Conseil international pour les initiatives écologiques locales, est partenaire de cette initiative.**

ICLEI la soutiendra et s'assurera de son positionnement au sein des structures existantes de suivi des actions sur le climat des exécutifs locaux et régionaux (**Transformative Actions Program (TAP)** – une initiative globale pour améliorer l'accès des villes et régions aux flux de capitaux; **carbonn Climate Registry (cCR)** – la plate forme de centralisation des actions des gouvernements locaux et régionaux sur le climat et le portail en ligne des solutions pour les gouvernements locaux).

L'objectif principal de cette plate-forme sera de construire une solidarité, des échanges d'expertises par exemple pour renforcer leur capacité d'action, entre les mégapoles dans leur adaptation au dérèglement climatique dans le secteur de l'eau en des termes reposants sur des solutions locales. Ces objectifs seront les suivants :

- collecter les données à l'échelle mondiale sur les stratégies et les résultats mis en œuvre par les autorités locales et leurs opérateurs de l'eau;
- développer le partage d'expérience entre les universitaires et les opérateurs et améliorer l'adaptation par l'évaluation d'expérimentations et de bonnes pratiques;
- identifier les moyens et les mécanismes de financement de l'adaptation des mégapoles aux impacts du dérèglement climatique sur l'eau en milieu urbain.

Cette plate-forme rendra compte de ses activités en :

- accroissant la sensibilisation sur l'eau et les mégapoles à un niveau international, par la promotion de la participation transversale dans différents forums, débats et conférences internationales, en mettant l'accent sur le dérèglement climatique, l'eau, l'habitat ou l'urbanisme;
- organisant tous les trois ans une conférence internationale sur l'eau dans les mégapoles, qui permettra de mettre à jour les connaissances et d'examiner les progrès réalisés à la fois dans le domaine de la recherche et au plan opérationnel. Elle pourrait également permettre le suivi de Cop en COP des engagements post-2015 faits à Paris lors de la COP 21.

**Afin de mettre en œuvre le Programme d'action Paris Lima (Paris Lima Action Agenda) et** sans plus tarder, un certain nombre de mégapoles sont déjà en train de s'engager à lancer des mesures visant à s'adapter aux ou à atténuer les impacts du dérèglement climatique. Les listes des mégapoles et leurs mesures sont annexées à la présente déclaration.

Pièces jointes:

Liste des mégapoles et de leurs mesures d'adaptation au dérèglement climatique

# **Appendix 1: List of megacities and their mitigation and adaptation actions addressing water and climate including ICLEI megacities**

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The following commitments and actions are addressing water and reported by megacities in the carbonn Climate Registry, world's leading reporting platform of local and subnational government climate action hosted by ICLEI.

1 – Actions from Africa : Lagos

2 – Actions from America : Buenos Aires, Chicago, Los Angeles, Mexico, San Francisco, São Paulo

3 – Actions from Asia : Seoul

4 – Actions from Europe : Istanbul, Paris

# 1 Actions from African megacities

<b>1. City</b> City of Lagos
<b>2. Activity title</b> combating Climate Change : Public Awareness Creation.
<b>3. Action type</b> Policy/Strategies/Action Plans
<b>4. Primary focus and method</b> Education to climate change
<b>5. Short description of the action</b> <p>The school Advocacy programme is an outreach programme where students of primary and post primary institutions in Lagos are educated on the issue of Climate Change by specially trained instructors Has over 35,000 club members in the State and 40 Specially trained instructors to take them on all aspect of Environmental management</p> <p>An instruction manual has been produced and circulated to instructors/schools. This manual which is regularly updated covers key areas in Mitigation and adaptation as well as Renewable energy solutions.</p> <p>The State Government produced a home video on Climate Change called 'IF ONLY'. The video identified, and dramatized the various sources of greenhouse gas emissions and pollution in Nigeria starting from homes, commercial premises and industries and why it is crucial that concerted effort should be made by all and sundry to abate it.</p> <p>Another aspect of the Advocacy programme is the school landscaping and beautification programmes where students are taught how to landscape and beautify their environment. Annually, there is a competition called ME AND MY TREE COMPETITION, where club members are made to plant trees with the planters of the most nurtured tree after one year rewarded by the State Government with a trip to Germany in an annual School exchange programme to the State of Bavaria.</p> <p>Aside from the landscaping programme, there is also the waste management aspect where the culture of waste sorting at source is inculcated on the students. Waste sorting bins have been procured by the State Government and distributed to various public schools in the State in support of this initiative.</p> <p>LAGOS SUMMIT ON CLIMATE CHANGE</p> <p>The state Government in March 2009 hosted the maiden Climate Change Summit and thereafter declared it an annual event.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of Lagos
<b>2. Activity title</b> Combating Climate Change Mitigation Programmes .
<b>3. Action type</b> Investment - Infrastructure
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> The state Government has taken some far reaching actions aimed at mitigating the impact of Climate change. Some notable achievement in this regard includes: i. The annual tree planting campaign programme: Starting from Year 2008 when the Campaign was flagged off, over 5 Million trees have been planted to date. An Agency known as Lagos State Parks and Gardens Agency has been established to ensure the continued survival of greenery programme ii Landscaping and beautification of virtually all open spaces, road verges, median and triangular laybys in the state. iii Introduction of BRT Scheme (Bus Rapid Transit ) iv Inventorization of wetlands in the state and putting modalities in place to reclaim all encroached sites v Use of Renewable Energy in all landscaped sites and public recreational parks as well as in some selected public infrastructures and Roads Others are: i. Integrated Waste Management programmes including the establishment of waste to compost facility at Ikorodu and Material Recovery facility at Solous dumpsite ii. Retrofitting of Old and New Secretariat complexes with energy saving bulbs, iii. Eko Solar projects where some Streets lights and roads in the state are powered with solar panels iv. Completion and commissioning of 4 independent Power project with others at advanced stages of completion v. Banning of 2 stroke engine vi. Light rail project vii. Lagos School Solar Project
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of Lagos
<b>2. Activity title</b> combating Climate Change : Adaptation programmes.
<b>3. Action type</b> Investment - Infrastructure
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> (i) Bar beach shoreline protection and reclamation project, (ii) Eko Atlantic City Project (iii) Massive dredging of canals and construction of new channels, (iv) Enforcement of Encroachment on drainage alignment (v) ZeroTolerance to building on drainage right of way (vi) Regular maintenance of drainages channels and canals (vii) Regular flood alert and early warning (viii) Various Climate Change scenario studies for Lagos State
<b>6. Finance</b> Local



## 2 Actions from American Megacities

<b>1. City</b> Municipality of Buenos Aires
<b>2. Activity title</b> Developing Green Roofs
<b>3. Action type</b> Technical- Infrastructure investment
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> <p>Green roofs and walls, consisting of rooftops and walls covered with vegetation, fulfill an important function: they decrease thermal range and reduce the loss of heat in winter and cold in summer, reducing the heat island effect, improve rainwater capture and can act as an air island for wild species. Buenos Aires City Government inaugurated its first Green Roof in 2011 and, because it was constructed on a public school building, a low maintenance design was chosen and a path was built across the green area for student use. Moreover, the plants chosen are resistant to a wide temperature range.</p> <p>The green roof has been constructed over part of the rooftop, so that two sectors of equal size and orientation were left to compare hydraulic balance and thermal benefits to the school. A follow up took place, measuring temperature differences and water capacity</p> <p>At the moment, more green roofs are being constructed in schools and other public buildings, under the Green Buenos Aires Plan. In the same line, the City has started the installation of green walls in urban highways.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Municipality of Buenos Aires
<b>2. Activity title</b> Adapting to heavier rains
<b>3. Action type</b> Technical- Infrastructure investment
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> In the light of an expected increase in extreme rain events and severe storms, and taking into consideration that in the City of Buenos Aires paving intensifies runoffs, the City works under a Hydraulic Plan. Important contributions to this strategy include the maintenance of the rainfall drainage systems, the management of water reservoirs, and the expansion of new piped relief channels to control the main underground creeks. The lack of these structures has produced significant flooding in several areas of the City in the past years. Buenos Aires has a series of protection stations against local southeastern storms as well as pumping stations at several level crossings. Remote-controlled robots and other technologies are used in the cleaning and maintenance of drains, chambers, and ducts of the rainfall drainage system.
<b>6. Finance</b> Local

# Action from Megacities

<b>1. City</b> Municipality of Buenos Aires
<b>2. Activity title</b> Meteorological Network
<b>3. Action type</b> Improving Assessment and Research
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> <p>In order to face weather changes it is essential to have consistent data collected over many years. A new sensor system seeks to complement the existing weather alert network, by better understanding the status of sewers and channel relievers, allowing the building of an early alert to possible flooding.</p> <p>The new system will provide underground information in real time about rainfall and storm effects in different neighbourhoods of the City. It will be equipped with water level sensors (limnigraphs) located in rainfall drainage systems which shall provide data regarding the amount of water concentrated in relation to pipe capacity during heavy rainfall events.</p> <p>Currently, the City of Buenos Aires has a weather alert network run by the Emergency Squad along with the Ministry of Environment and Public Space. The network has eight stations, and the Environmental Protection Agency plans to complete it by incorporating fixed Intelligent Monitoring Centres.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Municipality of Buenos Aires
<b>2. Activity title</b> Riachuelo River Bank
<b>3. Action type</b> Technical- Infrastructure investment
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> <p>In general, low-income population settles in precarious and highly crowded housing, in floodplains. Rainwater floods occur in different areas of the City of Buenos Aires every time it rains more than 30 mm in one hour, for which it is a recurrent problem that affects more than 350,000 people, 90,000 of which are located in precarious riverside settlements, on the bank of the Riachuelo River, a highly contaminated water body.</p> <p>As an important social challenge, the local Government aims to relocate the population settled on the towpath of the Matanza- Riachuelo River Basin, pursuant to the Environmental Recovery Integrated Plan. At the moment, more than 200 families have been provided with a new house outside the towpath, in order to provide a solution to this major socio-environmental problem as soon as possible, in accordance with a Federal Supreme Court ruling.</p> <p>This process also entails the recovery and valorization of the riverside with the aim of transforming this trail on the riverside with cobblestone, green areas, and a revegetation process.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of Chicago
<b>2. Activity title</b> Water Infrastructure Upgrades
<b>3. Action type</b> Technical- Infrastructure investment
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> The City is raising water rates to replace over 1,500 miles of water pipes and sewer lines. Conservation incentives improved with non-profit exemption removed and price consistent to cost. This action fits within the energy efficient buildings strategy which aims to reduce 4.6 MMTCO <sub>2</sub> e by 2020.
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of Chicago
<b>2. Activity title</b> Sustainable Backyards Program
<b>3. Action type</b> Public Participation - Stakeholder engagement
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b>  <p>The Sustainable Backyards (SusBY) program is the City's program that encourages Chicago residents to manage backyards sustainably, especially through the implementation of green infrastructure that reduces storm water runoff. Core functions include marketing, outreach and education and distribution of rainbarrel, compost bin, and native plants and trees rebates. Improving the program in 2013, online rebates are now available through a new webportal, allowing for faster and more reliable service to residents.</p>
<b>6. Finance</b> Local

## Action from Megacities

<p><b>1. City</b> City of Chicago</p>
<p><b>2. Activity title</b> Green Alleys and Permeable Pavements</p>
<p><b>3. Action type</b> Technical/Infrastructure investment</p>
<p><b>4. Primary focus and method</b> Adaptation</p>
<p><b>5. Short description of the action</b> Chicago Climate Action Plan has: Impacted 265 development projects with the stormwater management ordinance, resulting in 20% increase in permeable area per site and increase of 55 acres of permeable surface area; Installed 120 green alleys, resulting in the conversion of 32,000 sq. ft. of pervious and reflective surfaces.</p>
<p><b>6. Finance</b> Local</p>

## Action from Megacities

<b>1. City</b> City of Chicago
<b>2. Activity title</b> Deep Tunnel and Reservoir Plan
<b>3. Action type</b> Technical/Infrastructure investment
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> Chicago's deep tunnel and reservoir plan (TARP), its large civil engineering project operated by the Metropolitan water Reclamation District, aims to reduce flooding in the metropolitan Chicago area, and to reduce the harmful effects of flushing raw sewage into Lake Michigan by diverting storm water and sewage into temporary holding reservoirs.
<b>6. Finance</b> Local



## Action from Megacities

<b>1. City</b> City of Chicago
<b>2. Activity title</b> Green Stormwater Infrastructure Strategy Initiative
<b>3. Action type</b> Policy/Strategies/Action Plans
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> Mayor Emanuel announced the launch of the Green Stormwater Infrastructure Strategy Initiative, dedicating \$50 million of current spending on upgrades and improvements to the city's water and sewer infrastructure over the next five years to investments in green infrastructure. These projects will ultimately create an additional 10 million gallons of natural stormwater storage, which could reduce runoff by 250 million gallons annually. This is one of the largest voluntary investments in this type of infrastructure in the country, and expands Chicago's push to embed sustainability citywide.
<b>6. Finance</b> Local

# Action from Megacities

<p><b>1. City</b></p> <p>Los Angeles, California</p>
<p><b>2. Activity title</b></p> <p>Enhanced Watershed Management Programs</p>
<p><b>3. Action type</b></p> <p>Technical – Infrastructure investment</p>
<p><b>4. Primary focus and method</b></p> <p>Mitigation and adaptation</p>
<p><b>5. Short description of the action</b></p> <p>Together with 30 partner agencies, the City of Los Angeles developed Enhanced Watershed Management Programs (EWMPs) for four major watersheds in the Los Angeles region with multi-benefit water quality compliance strategies covering 2015-2035. The primary goal of the EWMPs to meet Clean Water Act regulations, 22 Total Maximum Daily Load water quality regulations, and the NPDES Permit for the Municipal Separate Storm Sewer System through the implementation of water quality improvement projects. The EWMPs identify many green-blue infrastructure projects with the secondary goal of stormwater infiltration for augmenting local water supplies, or stormwater reuse to offset potable water use. This will increase the availability of local water resources, reduce the reliance on water import, and reduce the energy demand of importing water.</p>
<p><b>6. Finance</b></p> <p>Regional and local</p>

## Action from Megacities

<b>1. City</b>
Los Angeles, California
<b>2. Activity title</b>
One Water LA 2040
<b>3. Action type</b>
Policy-Strategies-Action Plans
<b>4. Primary focus and method</b>
Mitigation and adaptation
<b>5. Short description of the action</b>
<p>The One Water LA 2040 program provides integrated strategies for managing water in Los Angeles by recognizing that wastewater, stormwater, groundwater, reclaimed water, and potable water may be different, but closely inter-related categories of water. The goals of the program include the identification of opportunities for inter-departmental collaboration and leveraging of resources, the break-down of institutional barriers, and providing a forum for meaningful stakeholder input. Program deliverables include facility planning for the wastewater and stormwater programs, while addressing climate change, and dwindling local water supplies. The project is led by LA Sanitation, and includes the participation of many City of Los Angeles departments and organizations, as well as regional organizations.</p>
<b>6. Finance</b>
Local

## Action from Megacities

<b>1. City</b>
Los Angeles, California
<b>2. Activity title</b>
Green-blue infrastructure
<b>3. Action type</b>
Technical – Infrastructure investment
<b>4. Primary focus and method</b>
Adaptation
<b>5. Short description of the action</b>
The green-blue infrastructure program of LA Sanitation focuses on the implementation of rainwater harvesting projects on the public right-of way, as well on private properties. This program has many components including the development of “how-to” manuals for home-owners and developers to capture rainwater and stormwater on their properties, the development of standard plans for design and construction of rainwater capture Best Management Practices on the public right-of-way, incentive programs for the installation of rainbarrels and cisterns on private parcels, and the development of policies and ordinances that require rainwater capture and reuse.
<b>6. Finance</b>
Local

## Action from Megacities

<b>1. City</b> Los Angeles, California
<b>2. Activity title</b> Emergency Drought Response – Creating a Water Wise City
<b>3. Action type</b> Technical – Infrastructure investment
<b>4. Primary focus and method</b> Mitigation and adaptation
<b>5. Short description of the action</b> <p>In response to the drought in California, Los Angeles mayor Eric Garcetti issued an executive directive in October 2014 requiring a per capita potable water use reduction of 20% by 2017, and a reduction of potable water import by Los Angeles of 50% by 2025. LA Sanitation is supporting these goals by reducing potable water use by its own facilities (wastewater treatment plants, refuse collection facilities, etc.), increasing the production and distribution (purple pipe) of reclaimed water, and the construction of stormwater capture projects that infiltrate stormwater or offset potable water use in the City.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Federal District of Mexico
<b>2. Activity title</b> Water Saving Program in Public Offices and Buildings
<b>3. Action type</b> Education- Awareness Raising
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> Execute actions of rational and efficient use of water that allow to reduce. In the framework of the Environmental Management System of the Mexico City Government, awareness actions are taken geared at engaging agencies in actions of rational and efficient use of water. To integrate this action in its policies, the Mexico City Government established the General Guidelines for the Procurement of Goods with Characteristics and Specifications of Less Environmental Impact, that establish the type of water saving products that must be purchased by the different agencies the environmental impact associated with their use in public offices and buildings of the Mexico City Government.
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Federal District of Mexico
<b>2. Activity title</b> Pilot program to increase electromechanical efficiency levels and hydraulic operation of the drinking water network of Sierra de Santa Catarina
<b>3. Action type</b> Assessment - Research
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> "Improve continuity of service and leverage existing infrastructure, by increasing electromechanical, physical and operating efficiency levels of the drinking water network of Sierra de Santa Catarina in Delegation Iztapalapa. The project was conducted on 2008, and in the face of the need to reduce the problem of water supply on the area, it was resumed and feedback was obtained in 2011."
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Federal District of Mexico
<b>2. Activity title</b> Electric power saving program in the operation of wells and pumping plants of the Mexico City water System (MCWS)
<b>3. Action type</b> Technical/Infrastructure investment
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> Implement actions that applied to operation of electrical equipment in wells and pumping plants of the Mexico City water System, generate savings in electric power consumption.
<b>6. Finance</b> Local



## Action from Megacities

<p><b>1. City</b> City of San Francisco</p>
<p><b>2. Activity title</b> Dep CAPs</p>
<p><b>3. Action type</b> Policy- Strategies- Action Plans</p>
<p><b>4. Primary focus and method</b> Mitigation</p>
<p><b>5. Short description of the action</b> Every City and County of SF Department is required by Board of Supervisor Mandate to complete a Climate Action Plan every year.</p> <p>This process allows all sustainability information and requirements to be captured under a cohesive program and reported through a single document while also enabling the Departments to track their carbon footprints on an ongoing basis. This is an unfunded mandate. The project is lead by the Climate Team at the Department of Environment and includes program staff from Zero Waste, Green Purchasing, Clean Air, SFPUC water and Power, Central Shops, Real Estate and Department of Technology.</p>
<p><b>6. Finance</b> Local</p>

## Action from Megacities

<b>1. City</b> City of San Francisco
<b>2. Activity title</b> Methane Recovery from Waste water Treatment
<b>3. Action type</b> Technical- Infrastructure investment
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> All methane produced on site at the Ocean Beach Waste water Treatment Plan is used to generate electricity and hot water. The hot water is used to keep the digesters heated. In all, the combined energy output accounts for 33% of the treatment plant's power needs.
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of San Francisco
<b>2. Activity title</b> Local water Supply Program
<b>3. Action type</b> Policy/Strategies/Action Plans
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> <p>Diversifying local water sources with recycled water is a critical part of San Francisco's long term water supply plan. The Westside Recycled water Project is part of the San Francisco Public Utilities Commission's Local water Supply Program, which is working to produce a reliable and sustainable local water supply through a combination of additional groundwater usage, more conservation, and increased water reuse.</p> <p>The project would include a new recycled water treatment plant that would provide 2 million gallons per day of advanced level treated water for non-potable purposes (e.g. on-drinking uses such as irrigation and toilet flushing) to a variety of customers on the west side of San Francisco. These customers include Golden Gate Park, Lincoln Park and the Lincoln Park Golf Course, the Presidio Golf Course and the California Academy of Sciences.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Municipality of São Paulo
<b>2. Activity title</b> Plan for Drainage and Rain water Management in the City of São Paulo
<b>3. Action type</b> Policy/Strategies/Action Plans
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> Guiding Plan for Drainage and Rain water Management in the City of São Paulo
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Municipality of São Paulo
<b>2. Activity title</b> Program of Goals of the City of São Paulo in the 2013-2016
<b>3. Action type</b> Policy/Strategies/Action Plans
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> Program of Goals of the City of São Paulo in the 2013-2016 administration. Lists 123 goals linked to 20 objectives, grouped in 3 thematic axis and 5 priority territorial areas. Within the thematic axis ' Sustainable Economic Development with Inequalities Reduction', includes objectives in the themes of green areas and water preservation; waste management and mobility
<b>6. Finance</b> Local

### 3- Actions from Asian Megacity

<b>1. City</b> Seoul Metropolitan Government
<b>2. Activity title</b> Discovering All Usable Energy Sources
<b>3. Action type</b> Technical/Infrastructure investment
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> <p>SMG recovers discarded energy and uses it as energy source for district heating. In 2012, it developed high-efficiency hydro power generation technology that could generate power at an altitude of less than 2 meters and applied it to a 360kW hydro plant built in the Noryangjin Distributing Reservoir. Based on the success of the pilot project, SMG will continue to discover energy sources for small-scale hydro plants including Jamsil Weir, sewage treatment centres, and water purification centres for the purpose of installing a total of 3,160kW small-scale hydro plants. SMG also seeks to recover heat from the exhaust gas of incinerator chimneys in order to use it as heat source for neighbouring areas. It will start with 9 locations at the Mapo Resource Recovery Facility and expand to a total of 32 chimneys by 2018, enabling the supply of heat to 70,000 households in neighbouring apartment complexes.</p> <p>At present, 243 subway stations draw a total of 120,000 tons of ground water and use only 20,000 tons for cleaning purposes, discharging the rest into streams. SMG plans to use the discarded ground water to cool and heat neighbouring buildings. It will launch a pilot project at the Korea University station in 2014 and expand to 10 stations by 2018 to service the Mokdong Ice Rink and the headquarters of Seoul Metropolitan Rapid Transit Corporation, among others.</p>
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Seoul Metropolitan Government
<b>2. Activity title</b> Eco-Mileage
<b>3. Action type</b> Policy- Strategies- Action Plans
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> The Eco-Mileage program engages homes and businesses in energy conservation (i.e. saving electricity, water, gas and district heating) by offering city government incentives. Eco- Mileage Members stay informed and motivated through regular e-mail and SMS reports of energy consumption data. As of August 2012, 627,000 homes and businesses have joined the program. The city government seeks to expand the program to 1 million members by 2014. Participating organizations: KEPCO, KEMCO, Ministry of Environment, Ministry of Land and Maritime Affairs, AEGIS Enterprise, apartment offices, environmental NGOs, Office of Education, schools, private buildings, BC Card Corp., LG Housys, Dajin DMP.
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> Mumbai City
<b>2. Activity title</b> Concrete Actions regarding Climate Change Adaptation related to water in Mumbai City
<b>3. Action type</b> Investment - Infrastructure
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> <p>As far Mumbai city is concerned, the focus of climate change adaptation is the apprehension in the rise of the High Tide Level (HTL) with a rise in global temperature. The concrete actions regarding climate change adaptation in Mumbai are the following.</p> <ol style="list-style-type: none"><li>1. Preparation of maps by the National Institute of Oceanography (NIO), Goa, indicating areas likely to be submerged by a one-metre, two-metre and three metre rise in the level of sea water. It is expected that a three metre rise in the level of water is extremely unlikely since by then most of the fossil fuels are likely to be exhausted and would be replaced by cleaner fuels. In fact, the global mean sea level is projected to increase only by 0.35 to 0.55 metres by the end of the 21st century. NIO has outlined the areas likely to be affected with such level rises on the Mumbai City maps. These maps would soon be forwarded to the Municipal Corporation for necessary preparatory action.</li><li>2. In any case, conditions very similar to rise in High Tide Line (HTL) are faced by Mumbai's citizens during the monsoons when a high rainfall coincides with a High Tide. The places in Mumbai which get flooded at such times are well-known. The Municipal Corporation of Greater Mumbai (MCGM) has prepared contour maps of these flood-affected areas and additional measures for a quick drainage of water are undertaken every year. The areas likely to face submergence because of rise in HTL will be the same flood prone areas and a vigorous implementation of the current measures is the best preparatory course for meeting the challenge.</li><li>3. The widening of storm water drains and additional storm water drains would counter the increase in water level.</li><li>4. The present treated sewerage in Mumbai is not clean enough for its acceptance for recycling. With improved sewerage and cleaner treatment the amount of recycled water will increase and to that extent the problems of water disposal will reduce.</li><li>5. Better sewerage management will also reduce the instances of overflowing of foul sewage and contamination of water lines.</li><li>6. After a rapid growth in the last few decades, the population of Mumbai City is showing signs of stabilization. Thus, it will now be much easier to plan for the city.</li></ol>
<b>6. Finance</b> local



## 4 - Actions from European Megacities

<b>1. City</b> Istanbul Metropolitan Municipality
<b>2. Activity title</b> Impacts of climate change on water resources in Istanbul
<b>3. Action type</b> Assessment- Research
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b> Planning of Rain-flow amount and water management
<b>6. Finance</b> Sub-national

## Action from Megacities

<b>1. City</b> City of Paris
<b>2. Activity title</b> Sustainable consumption policy
<b>3. Action type</b> Regulatory
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> Establishment of sustainable consumption policy for community and government through actions of responsible consumption, purchasing policy, management of water and waste.
<b>6. Finance</b> Local

## Action from Megacities

<b>1. City</b> City of Paris
<b>2. Activity title</b> Streets non-potable watering experimentations
<b>3. Action type</b> Assessment- Research
<b>4. Primary focus and method</b> Adaptation
<b>5. Short description of the action</b>  <p>The Paris city government is leading an experiment to quantify the cooling effect of watering streets with non-drinkable water in case of hot summer days. Instrumented watering experiments have been carried out for 2 nights in the 2012 summer, for 10 days in the 2013 summer, and so far for 2 days in the 2014 summer. Data are still under analysis and are part of a PhD study.</p> <p>The idea is to reduce temperatures—and by extension, heat effects—and thus create "urban cool islands" during the day for Parisians (limit the effects of heat waves for public health).</p>
<b>6. Finance</b> Local

# Action from Megacities

<b>1. City</b> Paris- Greater Paris Sanitation Authority (SIAAP)
<b>2. Activity title</b> Towards energy efficiency for sanitation services
<b>3. Action type</b> Assessment -
<b>4. Primary focus and method</b> Mitigation
<b>5. Short description of the action</b> <p>The SIAAP is the only interdepartmental water and sanitation authority in Europe. Each day it transports and treats 2.5 million m3 of wastewater, rainwater and industrial from the greater Paris area.</p> <p>The SIAAP has developed a sustainable development policy structured around a five-fold strategy:</p> <ol style="list-style-type: none"><li>1. <b>Contributing to the sustainable management of the greater Paris area ;</b></li><li>2. <b>helping to improve the living environment and health ;</b></li><li>3. <b>paying careful attention to social and societal expectations</b></li><li>4. <b>preserving natural resources ;</b></li><li>5. <b>responding global warming.</b></li></ol> <p>As part of this strategy, the SIAAP implements a variety of initiatives every year, from water-saving programs to adapt to rain variability to mitigation through improving the energy efficiency of its processes and infrastructure. For example, in order to identify areas for improvement and to assess its mitigation efforts within the framework of its sustainable development strategy, the SIAAP developed its own measuring tool for greenhouse gas emissions. This tool is used in its six wastewater treatment plants.</p> <p>The SIAAP is now capable of conducting its own overall assessment of GHGs and identifying the stages of its operations that emit the most pollution. This tool is also a decision support tool for the investment projects selected by the SIAAP.</p> <p>The SIAAP also develops ways to improve the energy efficiency of its wastewater treatment plants, which is a key driver for mitigating the effects of climate change in water and sanitation services. Over time, its motors will be replaced with more efficient motors and variable speed drives will be added to optimize energy consumption according to real-time needs. The SIAAP takes advantage of regulatory incentives in the form of energy savings certificates offering financial benefits in order to invest in more efficient equipment.</p> <p>Using the GHG measurement tool it developed, the SIAAP is able to monitor non-negligible impacts that affect nine million users in the Ile-de-France region. As a result of the energy efficiency retrofits carried out on its plants in 2013, their emissions have dropped by more than 25%.</p> <p><b>Strengths of project</b></p> <p>The sustainable development strategy focuses on the long term, it concerns all SIAAP activities and forms part of the concept of promoting urban ecology by implementing local synergy aimed at developing the thermal potential of effluents or generating power from non-fossil fuels.</p>
<b>6. Finance</b> Local

## Action from Megacities

<p><b>1. City</b> Paris- Greater Paris Sanitation Authority (SIAAP)</p>
<p><b>2. Activity title</b> Seine Morée wastewater cleaning plant SIAAP - France</p>
<p><b>3. Action type</b> Investment - Infrastructure</p>
<p><b>4. Primary focus and method</b> Mitigation</p>
<p><b>5. Short description of the action</b></p> <p>The Morée, flowing under the plant and gave it its name, is a small river (12 kilometers long) gradually reduced to the sewer role since the nineteenth century. By now receiving treated water from the plant, the Morée has regained its biological and chemical quality conducive to the development of biodiversity. The Seine Morée plant is used to ensure that wastewater is cleaned very thoroughly while limiting the use of chemical reagents.</p> <p>Background or General project description</p> <p>The Seine Morée plant is designed to achieve the goals of the European Union Water Framework Directive and to contribute to the renewal of the Morée, a small stream that crosses the site on which the plant is located.</p> <p><b>French Expertise</b></p> <p>The plant is in charge of the treatment of the wastewater of six municipalities in the north east of the department of Seine Saint Denis, near Paris. This covers 200 000 habitants. Its construction is part of an integrated vision of wastewater and sanitation management.</p> <p>In order to do so the plant uses highly innovative technology based on biological treatment and membrane separation sludge:</p> <p>After pretreatment, which aims to remove large debris, sands and fats, water undergoes a biological settling for the treatment of dissolved pollutants. The technology does not require chemical reagents.</p> <p>After biological treatment for the removal of carbon, phosphorus and nitrogen, the water undergoes a final step, unprecedented in sanitation at this scale, membrane ultrafiltration, which allows the removal of dissolved elements.</p> <p>The Seine Morée plant produces high quality discharges that can be used for watering and industrial uses.</p> <p>As a result, 99% of suspended matter, 95% of carbon pollution, 97% of phosphorous pollution and 70% of nitrogen pollution are removed.</p> <p>For sludge treatment, a new partnership was set up between two public industrialists, the Greater Paris Sanitation Authority (SIAAP) and the municipal association of household waste treatment (SYCTOM). Sludge from water purification will be treated with biowaste in a biogas plant. Residual wastewater after sludge treatment return to the Seine Morée plant to be cleared. 100% of the common waste will be recycled as a source of energy for the plants' needs or in the form of fertilizers for agriculture.</p> <p><b>Strengths of project</b></p> <p>The plants architecture meets the very latest environmental requirements and treats 500.000 m<sup>3</sup>/ jour.</p>
<p><b>6. Finance</b> Local</p>

