

Watershed management: contribution of urban and peri-urban forestry by Michelle Gauthier (FOMC) FAO

1/ Why to invest on urban watershed forestry

[Slide 3]

Over the recent decades, the World has witnessed an increasing number of weather events (even extreme) such as wind and rain storms, sand storm and droughts, all exacerbated by climate change. Glaciers and perennial snow are melting more quickly, reducing this important freshwater reserve and altering down-slope flows. At the same time, the World also witnesses general deforestation and land degradation due to industrial, farming and demographic pressure on forest.

Taken together, all cities and urban areas worldwide use 75% of the world's energy and are responsible for 75% of global greenhouse gas emissions, 60% of residential water use, and 76% of wood used for industrial purpose. These pressing headlines put pressures on the land use in and around human settlements and cities with most often resulting degradation of tree and forest resources. According to the last report on Forest Resources Assessment 2010, the rate of deforestation decreases but global data are not available for cities.

[Slide 4]

When the deforestation leads to watershed degradation around human settlements and cities, the watershed and forest functions of regulating water flows, preventing landslide, floods and droughts in the nearby downstream areas are lost. The cost for the society is huge in term of human life loose, residential, industrial and road infrastructure destruction, island heat effect and water supply shortage.

[Slide 5]

If today more than one billion city-dwelling people lack access to clean and healthy water, it is for many reasons such as those mentioned by the other speakers before me, but also because of the lack of integrated land use in urban and peri-urban environment and urban watershed management.

2/ How citizens, cities and governments build green, grey and blue infrastructure for water

[Slide 6]

The Concept of Urban Watershed Forestry

The urban watershed forestry approaches sets watershed-based goals for managing the urban forest as a whole rather than managing forest resources on a site-by-site or jurisdictional basis. It also encourages watershed managers, urban foresters and local authorities to systematically assess and manage forest cover at the watershed level with the basic aim of reducing forest loss, increasing forest cover over time.

[Slide 7]

The Concept of Urban and Periurban Forestry – What and why green infrastructure for cities

The physical framework of a community is called its infrastructure. These utilitarian workhorses of a city can be divided into green and gray. Green infrastructures are areas covered with trees, shrubs, and grass; gray infrastructures are areas of buildings, roads, utilities, and parking lots. Green infrastructure

(also called “soft”) is porous, allowing water to soak into soil which naturally filters pollutants before entering rivers. Gray (also called “hard”) infrastructure is impervious, forcing water to runoff and which must be managed and cleaned before entering rivers. While both gray and green infrastructure are important in a city, communities that foster green infrastructure wherever possible are more livable, produce fewer pollutants, and are more cost effective to operate. However, balancing the gray with the green can be a serious challenge for a local government manager.

[Slide 8]

The resilient and healthy city will then optimize the tree and forest component through patches and corridors and blocks that will insure all functions in an harmonious transition from the built up core city up to the watershed limits.

Other reasons for promoting Forest & Trees in cities: the Products

In addition, when there cities have an optimal tree and forest canopy within the urban environment, they benefit from many added-values intrinsically arising from the protection from winds, buffering from extreme of temperatures. The products coming from:

- the harvesting of fruit trees and agroforestry systems
- wood energy for industrial and residential heating
- and other arguments demonstrating the positive economic and social return to the society.

[Slide 9]

Let look at some examples of how cities has responded to the challenge and has acquired expertise in urban watershed management:

Water Resources, Quality issues

- Where municipalities have protected forests for their **water resources, quality issues** have generally been the primary motivation. In **Tokyo, Japan**, for example, the Metropolitan Government Bureau of Waterworks manages the forest in the upper reaches of the Tama River **to increase the capacity to recharge water resources, to prevent reservoir sedimentation, to increase the forest’s water purification capacity and to conserve the natural environment.**

Cost-Efficiency and Saving

- Many municipalities (although certainly not all) cite maintenance of a **pure water supply as a reason for introducing forest protection or reforestation.** The city of New York is famous for its use of protected forests to maintain its high-quality water supply. This approach was supported by popular vote in part because it was a **cheaper option than building more treatment plants.** Consumers include: eight million NY City residents; and, 1 million residents. The partnership was organized to protect and to ensure that New Yorkers continue to **enjoy high quality, affordable drinking water and to avoid the need for costly filtration** - a cost estimated at between \$8.0 to \$10.0 billion to construct the facility and approximately \$1.0 million each day to operate and maintain the filtration plant.

[Slide 10]

Incentives – Payment for environmental Services

- Recognition of the issue of water for cities has encouraged the development of systems in which land users are paid for the environmental services that they generate through management. The central principle of the **“payment for environmental services” (PES) approach** is that those who provide environmental services should be compensated for doing so from those who receive the

services. Projects using water resources as a springboard for PES schemes have mainly been developed in **Latin America**, but interest is quickening throughout the world. In **Quito, Ecuador**, for example, water companies are helping to pay for the management of protected areas that are the source for much of the capital's drinking-water.

- Cities are **paying for Environmental Services (PES)** to secure their water provision.
 - Payment to providers:**
 - Payment in cash, but also in kind;
 - Cities even acquire land to ensure maintenance of certain land uses (in particular forest cover): from 10 to 400 USD/ha/year
 - Payments by users:**
 - The range of payments to the service providers vary widely.
 - When it is a voluntary agreement, city water users do contribute through their water bill for the watershed management (some USD cents/cubic m)

[Slide 11]

Managing flood water and disaster risk

- **A New Tree Ordinance, Energy and Water Conservation (San Antonio, Texas, USA)**

"Flooding in San Antonio is an age-old issue," says Carol Haywood, a planner with San Antonio's neighborhood and urban design department who is eyeing the green data layer's public education potential. **"Most folks think we need more concrete culverts to simply whisk the water away as fast as possible. We will use [this] a green data layer to model and demonstrate the ability of trees to perform a similar function without adding new concrete."**

Phase 1: Tree loss trends

 - 22% tree canopy decline from 1985-2001
 - Loss of \$9 million in air pollution mitigation per year.
 - Loss of \$146 million in storm water management services.
 - Loss of \$17.7 million in residential summer energy services per year

Phase 2: Green Data Layer (future implementation)

 - Protect significant ecological areas within ground water recharge zones
 - Determine optimal tree canopy cover in new development
 - Prioritize planting for energy conservation
 - Improve flood control while reducing gray infrastructure

[Slide 12]

3/ FAO interdisciplinary approach on forest, water and watershed for cities

From the lessons learned in balancing the grey, the green and the blue in cities, communities with local and national governments need to and can:

- **Quantify** the presence of green infrastructure and its function for air and water improvement.
- Once quantified, designate green infrastructure **as a public utility** (just as gray infrastructure is) in the budget process)
- Establish a **tree canopy goal** or target as part of every development and management project to utilize its functional potential
- Adopt **public policies, regulations, and incentives** to increase and protect green infrastructure

[Slide 12]

FAO supports the challenge of the countries and cities.

Forum and Dialogue on Watershed, Mountain and Landslide

- GEF Project in the Fouta Djallon: “Transboundary watershed management and regional integration in West Africa”. This project involving 9 West African countries bring us to the fundamental relationship between mountain/upland/upstream/humid and flat/lowland/downstream/dry areas dependant from the third longest river in Africa.
- “The New Generation of Integrated Watershed Management” into practice.
- 28th Session on the EFC Working Party on the Management of Mountain Watersheds “Forests for Water – Water for Forests” (12-16th September 2011, Kastamonu, Turkey. [List of partners]

[Slide 14]

- The **Second World Landslide Forum** “Putting Science into Practice”, 3-9 October 2011. FAO/HQ.
- Payment for Environmental Services”- The **D-Group on PES moderated by NRL/FAO** on the web.
- **“Are water and forests free of charge” Which role for the Green Economy?”**, Geneva, 4-5 July 2011, organized by the UNECE Water Convention and the UNECE/FAO Forestry and Timber Section. (UN Economic Commission for Europe)
- The FAO TCP Project « **Watershed management and strategy against water erosion in Brazzaville** » responds to the repetitive floods that the city suffered since 2006. The city, government and civil society will devise an Integrated watershed management planning, give a predominant role to agroforestry, and propose a strategy and action plan for urban forestry.

[Slide 15]

Waste Water Reuse for Reforestation and Agroforestry in arid zones and low forest country cover

- FAO, with the financial support of the FAO-Italian Project GCP/INT/059/ITA, organized a workshop in Hammamet, Tunisia from 16 to 17 October 2010 on forest restoration using treated waste water. Participants from Algeria, Egypt, Morocco and Tunisia reported in Plenary Session on the status and needs of treated waste waters for irrigation in forestry and agroforestry systems in their country. The purpose of the Workshop was to prepare a project on the use of treated waste water in forest restoration to sustain smallholders and farmers livelihood in four Mediterranean countries: Algeria, Egypt, Morocco and Tunisia.
- **Countries are seeking safe, environmentally sound and cost-efficient ways to treat and dispose of wastewater produced by urban communities and industries.** At the same time, increased attention is being focused on the role that forestry, traditionally a rural-based sector, can play in improving the urban and peri-urban environments in arid and semi-arid regions. Project outputs and activities will strengthen smallholder and farmer capacities in the use of recycled waste water on **planted forests and agroforestry irrigation in urban and peri-urban lands.**

Urban forests and trees & Forest Resources Assessment

- FAO is preparing a special report on Trees outside forests, paying attention to agroforestry systems and tree resources in and around cities. The report will evaluate assessment methods and available information and make recommendations for a comprehensive “Forest Resources Assessment” process that include urban resources. The report will pay particular attention to the need of international conventions and reporting for climate change.

Guidelines, Strategy and Action Plans for Healthy and Resilient City: Building a common vision for all

- FAO is assisting countries in preparing, for 2012, Guidelines for Policy and Decision Making to promote urban and peri-urban forestry. This planning tool will encourage multidisciplinary and sectoral dialogue in order for the citizens to build a common vision for their cities.
- **Priority themes:** Governance & Civil Society; **Urban and regional planning (green infrastructure);** Climate Change; **Disaster risk management; Water and water waste; Watershed management;** Health and wellbeing; Population, food security and nutrition; Income and employment; **Ecosystem services;** Investment and resource mobilization
- An International Workshop will be held in Glasgow, 30th and 31st May 2011, to design the Guidelines and put in place regional platforms and discuss communication strategy.

[Slide 16]

4/ Merging agendas: Blue, Grey and Green (urban, trees & forest and water)

Urban Agenda

- **2nd World Congress on Cities and Adaptation to Climate Change** – (ICLEI - Resilient Cities). 3-5 June, Bonn, Germany
- **EcoCity World Summit 201, 22-26 August, Montréal, Canada**
- **10th World Congress of Metropolis, 22-23 November, Porto Alegre, Brazil, Metropolis**
- **6th World Urban Forum, 2012, UN Habitat**

Urban and Peri-Urban Forestry (UPF) + Forestry Agenda:

- **II Mediterranean Forest Week, 5-8 April 2011, Avignon, France, FAO, Silva Mediterranea and other co-organizers**
- **FAO International Workshop, 30-31 May, Glasgow, UK, FAO**
- **14th European Forum on Urban Forestry, 1-4 June, Glasgow, UK, IUFRO**
- **Second World Landslide Forum, 3-7 October, Rome, Italy, IPL**

Watershed Agenda:

- **Cities of the Future: Sustainable Urban Planning and Water Management, 22-25 May, Stockholm, Sweden, IWA, IFHP and other co-organizers**
- **Payments for Environmental Services – Are water and forest free of charge? 4-5 July 2011, Geneva, Switzerland. UNECE, FAO and other co-organizers**
- **8th International Conference on Urban Watershed Management, 6-8 September, Beijing, China. UWRRC**
- **28th Session of the EFC Working Party on the Management of Mountain Watersheds “Forests for Water – Water for Forests”, 12-16 September, Kastamonu, Turkey, FAO**

Other Agendas: UPA + Water + Poverty Alleviation + etc.

[Slide 17]

5/ UN International Year of Forests 2011 – “Forests and People”

This is an opportunity to put water, forest and urban issues high on policy agendas.

March: “Forests and **Water**” [FAO/UNCCD] (22 March 2001)

October: “Forests and **Urban Forestry**” [FAO/IUFRO]
World Habitat Day (UN-HABITAT) – 3rd October 2011 (1st Monday of Oct.)

December: “Forest and **Mountains**” [FAO-MPS/UNCCD] (11 December 2011)
World Mountain Day

[Slide 18]

6/ Conclusions and way forward

By 2025, 1.8 billion people will be living in regions with absolute water scarcity and two-thirds of the world's population may experience water-stress conditions. Forests capture and store water and can play an important role in providing drinking water for millions of people in the world's mega-cities.

Given this fact, the members of the Collaborative Partnership on Forests (**CPF**), international organizations involved in forests, **call upon countries to pay more attention to forest protection and management for the provision of clean water.**

*“A town is saved, not more by the righteous citizens within it, than by the woods that surround it.....”
Henry David Thoreau, 1862*