

## Purpose of this BN

This Briefing Note serves to raise awareness, across all sectors, of the importance of wetlands as vital natural infrastructure within urban and peri-urban environments; to stimulate efforts to stem the loss and degradation of wetlands; and to highlight the important roles wetlands can play in improving human well-being in urban areas. It is addressed to two audiences:

- Those responsible for urban planning and management, including local, state or provincial councils and administrative units.
- Those involved in maintaining and managing wetlands, including: Ramsar National Focal Points; national, sub-national and local policy-makers; legislators and regulators; administrators; and planning and implementing bodies.

## Background

The Ramsar Conference of Contracting Parties, in Resolution X.27 on *Wetlands and urbanization*, called on the STRP to prepare guidelines for managing urban and peri-urban wetlands in accordance with an ecosystem approach. It approved the resulting *Principles for the planning and management of urban and peri-urban wetlands* through Resolution XI.11 in 2012.

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## Towards the wise use of urban and peri-urban wetlands

This Briefing Note expands on the principles for the planning and management of urban and peri-urban wetlands agreed by the Contracting Parties to the Ramsar Convention, and aims to help managers and planners of towns and cities ensure the wise use of wetlands.

Sustainable towns and cities can drive economic development, increase wealth generation and enhance the overall quality of human life, all within a smaller footprint and at a lower per-capita resource use than any other settlement pattern. However, unsustainable urbanization continues to drive wetland loss and degradation in some parts of the world. Increasingly, people working to make towns and cities more sustainable recognize wetlands as essential natural infrastructure which can deliver a range of benefits to a variety of beneficiaries in urban and peri-urban environments. This Briefing Note provides further guidance on how to deliver the dual goals of wise use of wetlands and sustainable urbanization.

### Key messages

- The benefits which wetlands deliver, such as providing drinking water, mitigating flood risk and regulating local climate, underpin human well-being in towns and cities. Therefore, the loss and degradation of urban and peri-urban wetlands diminish human well-being.
- Towns and cities are human constructs, and as such human society can influence and shape the evolution of towns and cities by integrating the principles of wetland wise use into planning and management decision-making.
- Wetlands should be considered as solution providers within an urban and peri-urban context, which can mitigate risks from a changing climate, support food production for a growing population and generate income through tourism and recreation.
- Too often the benefits which wetlands provide within urban and peri-urban environments are not fully recognized. The benefits provided by wetlands should be recognized and better integrated into planning and decision-making.
- The principles annexed to Resolution XI.11 should be adopted by local governments and integrated across all sectors and departments involved in the planning and management of towns and cities.
- The bodies of the Ramsar Convention and its wider networks should disseminate guidance and examples of how to implement the principles.

## Wetlands in an urban world

Towns and cities are vital human constructs, and human society can control their development trajectories. The agglomeration and densification associated with well planned, sustainable cities can provide distinct advantages which drive economic development, increase wealth generation and enhance the overall quality of life of citizens. All of this can be achieved within a smaller footprint involving lower per-capita resource use and emissions than any other settlement pattern (UN Habitat, 2012). Therefore, urbanization can be a force for good.

Whilst cities currently only occupy 2% of the Earth's surface, they use 75% of the world's natural resources and generate 70% of all the waste produced globally (ICLEI, 2010). However there is a growing body of evidence that sustainable urban planning can enable densification and agglomeration and at the same time reduced per-capita resource use (UN-Habitat, 2012).

Ecosystems, and wetlands in particular, are foundations of sustainable cities which support economic advantages and underpin human well-being. However, unsustainable urbanization all too commonly causes the loss and degradation of wetlands. This Briefing Note describes the drivers of this loss and degradation, and presents the "Principles for the planning and management of urban and peri-urban wetlands" which Ramsar Contracting Parties agreed in Resolution XI. 11.

The Principles highlight a range of potential solutions which can be applied to place towns and cities onto a

### Definitions: urban areas and urbanization

There is no widely shared definition of **urban areas**; different countries use a range of criteria to identify them, including population, population density, predominant land use and administrative status. Urban areas may include cities, towns and informal settlements. **Peri-urban areas** lie between the city and the countryside, and combine urban and rural uses of land. **Urbanization**, in the context of this Briefing Note, describes the increase in the proportion of people living in urban areas, and the resulting growth of these areas.

sustainable development trajectory. Through their implementation, the engagement with appropriate stakeholders, and the development of holistic approaches which integrate wetland benefits at the heart of urban decision-making, the potential to deliver wetland wise use increases greatly.

### Urban areas and the wetlands they affect

Urban and peri-urban human populations have been linked to wetlands since the dawn of civilization. The establishment and prosperity of the earliest towns and cities in Mesopotamia were dependent on wetlands of the Tigris and the Euphrates and the benefits they provided.

The relatively flat terrain associated with river floodplains and estuarine wetlands is easier to urbanize than upland areas, resulting in a concentration of human developments in these habitats (Zedler and Leach,

### The water footprints of cities

Understanding the relationship between water and cities is crucial. Cities can generate immense 'water footprints' through a range of consumptive and non-consumptive activities. The unsustainable planning and subsequent use of water resources to support urban populations can have significant impacts on wetlands and the biodiversity they support far beyond the peri-urban environment. Differences in water footprints depend primarily on the following four factors:

- i) the total volume of water consumed, which is generally related to the gross national income of an area;
- ii) the extent of water-intensive consumption, such as where the population consumes a high proportion of meat: it has been estimated that an average of about

16,000 kg of water are required to produce 1 kg of beef; iii) the presence of climatic extremes, especially in regions with a high evaporation rate where the water requirement per unit of crop production is relatively large; and iv) the extent of water-inefficient agricultural practice, where the water requirement per unit of crop production is relatively large.

Thus the water footprints of cities reflect consumptive patterns, economic prosperity, climate and food demand.

Chapagain, A.K. and Hoekstra, A.Y. 2003. Virtual water trade: a quantification of virtual water flows between nations in relation to international trade of livestock and livestock products. In Hoekstra, A.Y. (Ed.) *Virtual water trade Proceedings of the International Expert Meeting on Virtual Water Trade*. Value of Water Research Report Series No. 12, 49-76. IHE Delft, Delft, The Netherlands.



Urban wetlands supporting vital livelihoods, Densu Delta Ramsar Site, Greater Accra, Ghana. © R.J.McInnes 2013

1998). Water and other natural resources associated with wetlands also attract the human settlements and economic activities which result in the degradation of those wetlands.

Across the world, urbanization has continued in such areas. Extensive informal settlements are situated close to rivers and other wetlands, as people depend on these ecosystems for drinking water, irrigation water for local urban agriculture, and for other resources such as wild vegetables, fruits, fibre and medicines. This has resulted in a progressive direct loss of coastal and floodplain wetlands through drainage or infilling, as well as indirect degradation through activities away from these areas such as water abstraction or conversion of wetlands to agricultural land (Lee et al., 2006; Bolca et al., 2007).

The impacts of urban areas are not limited to lowland wetlands. Although cities act as catalysts for economic and social development, their ecological and hydrological footprints extend over considerable distances, covering areas considerably greater than the geographical extent of cities themselves (Kareiva et al., 2007). Pressures on water resources, such as ground-

water abstraction and the contamination of surface and groundwater by pollutants, have been documented as extending well beyond the urban administrative boundaries (Hollis, 1990; Kingsford, 2000).

The natural resources required to sustain cities can be immense (Faulkner, 2004). Overall, the demands humankind places on nature already exceed the biosphere's ability to regenerate resources and provide services: the global average demand on biologically productive land equals 2.2 hectares per person versus an available 1.8 hectares per person (Wackernagel et al. 2006). This measure of human demand on the Earth's ecosystems has been referred to as the 'ecological footprint' (Rees, 1992).

A study of the ecological footprint of Vancouver, Canada, demonstrated that the city required an area some 200 times larger than the geographic area of the city to support its population (Rees and Wackernagel, 1996). A more striking picture emerges for London: the ecological footprint of Londoners has been estimated at 49 million global hectares, which is 293 times its geographical area. That is approximately twice the size of the UK, and roughly the same size as Spain (BFF, 2002).



## Urbanization and wetlands

Despite the establishment of early urban centres some five millennia ago, most people continued to occupy rural areas. However, this situation has changed markedly in recent years. Since the mid-2000s, more than 50% of the Earth's population have lived in cities and towns. This shift from a rural to a predominantly urban population is predicted to continue at up to almost 4% per year, with the rate of increase in urban populations being greatest in the least developed nations. Some estimates have suggested that, by 2030, 80% of the human population will live in urban areas.

As they expand and develop, cities can drive social and economic development. They offer shelter, jobs and services and provide a nexus of productivity. As they attract more and more people, they generate an ever increasing proportion of countries' gross domestic product (GDP).

It has long been recognized that urbanization can have direct and indirect impacts on the environment, and

### Lagos, Nigeria: Mangrove loss through unplanned urban development

Lagos, currently the fifth largest city in the world, is the largest manufacturing and port city in West Africa and a focal point for business and economic development in Nigeria. Metropolitan Lagos is situated on a narrow lowland coastal area which originally supported mangrove swamps. To facilitate city development, rapid and unplanned land reclamation has been achieved by infilling coastal swamps and floodplains. Not only has this impacted directly on wetland biodiversity, but the destruction of mangroves and wetlands has reduced the flood storage capacity of the land, resulting in increased frequency of flooding.

It has also been noted that while economic activity and urban development often increase the environmental pressures that lead to flooding, it is usually the lowest income settlements and poorest groups within urban settlements that tend to be the most vulnerable.

McGranahan, G. Balk, D. and Anderson, B. 2007. The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones. *Env. and Urban. 19*, 17- 37.

Adelekan, I.O. 2009. Vulnerability of Poor Urban Coastal Communities to Climate Change in Lagos, Nigeria. *Paper presented at the Fifth Urban Research Symposium, Marseille, France. June 28-30, 2009.*

that wetlands are particularly susceptible to these impacts (Darnell, 1976; Maltby, 1986). Progressive unsustainable urbanization continues to destroy and degrade natural capital and wetlands in particular.

For example, increases in sediments washed into a river from urban developments can change the natural riverine processes and the flow regimes, resulting in a change in the structure of the channel and consequently the in-stream habitats vital for a range of animals and plants (Keddy, 1983; Booth and Jackson, 1997; White and Greer, 2006).

The extent of urbanization not only results in direct habitat loss, but also generates additional pressures on existing biodiversity. The prevalence of invasive species which may spread out from urban areas, out-competing native biota, and the increased demand on peri-urban agriculture to support the growing urban population can frequently accelerate negative impacts on biodiversity (Gerrard, 2004; Pauchard et al., 2006).

As the urban population grows, the requirement for food increases. There are documented cases which demonstrate the detrimental impacts on waterbirds and other animal populations of illegal hunting by city-dwellers in both urban green spaces and peri-urban habitats (Lannas and Turpie, 2009).

Unplanned expansion and mismanagement of urban areas will continue to generate a range of negative impacts on the environment. These impacts will vary in their scale and geographic scope. Some impacts may be short-term and only locally significant. Others will be long-lasting, extend well beyond municipal boundaries and leave an almost indeterminate legacy.

## The wise use of urban and peri-urban wetlands

Wetlands are highly diverse and support a great diversity of life. It is well documented that wetlands have progressively been lost and degraded due to human activities for thousands of years. They are recognized as being lost at a greater rate than any other type of ecosystem (Millennium Ecosystem Assessment, 2005). Impacts associated with urban expansion are among the drivers of this loss.

For the prosperity of future generations and the conservation of wetland biodiversity it is essential that

### Wise use of That Luang Marsh, Vientiane, PDR Laos

That Luang Marsh lies on the outskirts of Vientiane, Lao PDR, and provides ecosystem services of vast economic benefit to the city. Not least among these services are the protection of the city against flooding and the cleaning of waste water.

Population growth and unregulated housing and industrial development have threatened the marsh and undermined its ability to provide these services. NGOs including WWF Laos and the Wildfowl and Wetlands Trust (WWT) have worked with the city government to improve water quality, by implementing pilot projects to restore and construct areas of wetland within the wider marsh.

Pilot study locations were selected based on four criteria:

- i) to address existing problem areas related to waste water around That Luang Marsh;
- ii) to be in areas which will test constructed wetlands in a range of situations;
- iii) to be in areas where there is clear interest and ownership by local stakeholders; and
- iv) to have a pre-identified management scenario for after the wetland is constructed.

Locations were selected to address the treatment of waste from a local school, households, a pulp and paper mill and a brewery. Some issues arose during the establishment phase, primarily associated with leakage resulting from undertaking wetland construction during the dry season and with the management of seasonal extreme water level fluctuations. Nonetheless, the sites have provided effective water treatment and also wider benefits to local communities including education, aesthetic values and biodiversity.

The wise use of wetlands within the That Luang project promotes low-cost, low-energy sustainable means to treat urban waste water, and also to provide a range of collateral benefits for local residents who depend on the marsh for their well-being. The successes at That Luang have depended on the implementation of adaptive management plans through community consultation, training local people on the use of wetlands to treat polluted water, and raising local awareness of the benefits the marsh provides.

Gerrard, P. (2004). *Integrating wetland ecosystem values into urban planning: the case of That Luang Marsh, Vientiane, Lao PDR*. Vientiane, Lao PDR: IUCN-International Union for the Conservation of Nature Asia Regional Environmental Economics Programme and WWF Lao Country Office.

Gerrard, P. (2010). *Technical overview, the WATER project's pilot constructed wetlands and lessons learned*. Vientiane, Lao PDR: WWF, Laos.

urban development is planned and managed in ways that are sustainable, recognizing the need to protect the natural resource base that sustains urban areas. The challenge is to raise awareness of the importance of wetlands as providers of benefits to urban populations and their potential to operate as essential water management infrastructure and regulate the impacts of urbanization, and to provide guidance on how this should be achieved.

#### What is the wise use of wetlands?

The 'wise use' of wetlands, at the centre of the Ramsar philosophy, is defined as "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development" (Ramsar Convention Secretariat, 2010). Wise use "has at its heart the conservation and sustainable use of wetlands and their resources, for the benefit of humankind" (Ramsar Convention Secretariat, 2008). The principle of wise use is particularly relevant for wetlands located in urban or urbanizing areas and for those wetlands which support essential water and food requirements of urban areas (Emerton et al., 1998).

#### Ecosystem services provided by urban and peri-urban wetlands

It is clear that whilst the human population is becoming increasingly urban, the quality of urban life still depends on 'nature', particularly on global ecosystem services (Bolund and Hunhammar, 1999), even though societies still pursue resource exploitation rather than embracing resource interdependence (Everard, 2008).

Wetlands play a crucial role in providing these services, and there is increasing evidence of the importance of managing and restoring urban wetlands (Tong et al., 2007). A review of the ability of urban ecosystems to generate local and direct ecosystem services in Stockholm, Sweden, demonstrated that of seven ecosystem types (street trees, lawns/parks, forests, cultivated land, wetlands, streams and lakes/sea) only wetlands delivered all six of the services assessed (air filtering, micro-climate regulation, noise reduction, rain-water drainage, sewage treatment and recreational or cultural values).

A review of 29 urban case studies conducted on behalf of UN-Habitat demonstrated that wetlands provided a

### The value of urban wetlands, Kampala, Uganda

Kampala, the capital of Uganda, is rapidly urbanizing and expanding due to high population growth with resultant demands on land for housing, industry and commercial activities. Covering around 5.5 square kilometres, the Nakivubo Swamp extends from the central industrial district of the city, through residential settlements, before entering Lake Victoria. The Swamp receives a variety of wastewaters contaminated with the by-products of many industrial and urban activities. Biogeochemical processes within the Swamp mitigate the impact of these contaminants and filter and purify the water prior to discharging into Lake Victoria.

It was estimated in 2003 that the infrastructure required to replace the water treatment function of the Swamp would cost in the region of US\$2 million a year, demonstrating the immense value of the wetland to the citizens of Kampala and reinforcing the need to protect the area against the pressures of urban expansion.

Emerton, L. and Bos, E. 2004. *Value. Counting ecosystems as an economic part of water*. IUCN, Gland, Switzerland and Cambridge, UK. 88pp.

greater number of benefits to citizens than other ecosystems (McInnes, 2013). It provides further evidence to support the view that urban wetlands can reduce flood risk, improve water quality and provide a range of other important ecosystem services (Bolund and Hunhammar, 1999).

However, despite their importance, these benefits are often unrecognized or insufficiently acknowledged in decision-making, which ultimately undermines the conservation of wetlands and impedes their wise use (McInnes, 2013).

### Wise use of wetlands and sustainable urban development: the Ramsar response

Ramsar's 10th meeting of the Conference of the Contracting Parties (COP10) in 2008 recognized that wetlands in urban and peri-urban areas can provide a range of important benefits to people and nature. COP10 adopted Resolution X.27 on *Wetlands and urbanization* which, among other things, called on the Convention's Scientific and Technical Review Panel (STRP) to prepare guidelines for managing urban and peri-urban wetlands in accordance with an ecosystem approach, taking into account issues including climate change, ecosystem services, food production, human health and livelihoods.

### Resolution XI.11 on Principles for the planning and management of urban and peri-urban wetlands

These guidelines were produced in close collaboration with UN-Habitat, and adopted by Contracting Parties through Resolution XI.11 on *Principles for the planning and management of urban and peri-urban wetlands*. Resolution XI.11 urges Contracting Parties to continue to promote the conservation and wise use of wetlands in urban and peri-urban environments, and of those beyond the urban boundary that are affected by urban activities and developments. It calls for them to integrate this activity into efforts to achieve sustainable urban development and adequate shelter for all, as a contribution to achieving the Millennium Development Goals.

Resolution XI.11 also recognizes that urban development should be planned and managed in a sustainable way, with particular reference to Resolution XI.9 on *An Integrated Framework for avoiding, mitigating and compensating for wetland losses*, and invites Contracting Parties and other organizations to raise awareness of, and provide guidance on, the importance of wetlands as providers of benefits to urban and peri-urban populations.

The adoption of Resolution XI.11 placed obligations on Contracting Parties to consider principles both for policy development and implementation and for the practical management and wise use of wetlands.

### Policy principles

The COP11 Resolution spells out five policy recommendations which national and local levels of governments need to consider and implement when developing policies that jointly address urban planning and management and the wise use of wetlands:

**Policy principle 1:** Wetlands and the range of services they provide are essential elements of the supporting infrastructure of urban and peri-urban settlements.

**Policy principle 2:** The wise use of wetlands contributes to socially and environmentally sustainable urban and peri-urban areas.

**Policy principle 3:** Any further degradation or loss of wetlands as a result of urban development or management should be avoided, and where not



possible, any impacts should be mitigated, and any residual effects appropriately compensated for by offsets such as wetland restoration.

**Policy principle 4:** The full participation of indigenous and local communities, municipalities and government sectors involved in urban and peri-urban spatial planning and wetland management decision-making is vital to creating sustainable urban and peri-urban settlements.

**Policy principle 5:** The threat of natural calamities and human-made disasters and their impacts on urban populations and wetlands requires government priority and convergent actions to enhance resilience to disasters.

### Practical principles

The Resolution goes on to describe practical principles which should define best practice in sustainable urban development and wetland wise use:

#### Practical principle 1: Wetland conservation

- i. Urban development should avoid, whenever possible, destroying wetlands.

#### Practical principle 2: Wetland restoration and creation

- i. Wetlands should be restored and/or created as elements of urban and especially water management infrastructure in order to maintain or enhance ecological character and optimise ecosystem service delivery.
- ii. Opportunities to restore wetlands should be prioritized ahead of the creation of new wetlands. The creation of wetlands should be encouraged according to the regulations of each Contracting Party and established only in cases where other alternatives do not exist and related to economic and social projects, taking ecosystem services into consideration.



Local climate regulation, recreation, culture and a sense of place: some of the values of urban wetlands, Xi'an, China. © R.J.McInnes, 2013



The London Wetland Centre, UK, delivering multiple benefits within a major urban landscape. © R.J.McInnes 2013

**Practical principle 3:** Understanding the value of wetlands

- i. Opportunities to reduce urban poverty through the optimisation of sustainably utilised wetland ecosystem services, in accordance with the wise use principles, should be pursued urgently.
- ii. Trade-offs in terms of livelihood options and economic benefit-sharing, involving both the market and the state, need to be considered.
- iii. Incentive systems such as payment for environmental services should be applied within and beyond urban environments to protect wetlands.
- iv. The values of wetlands need to be articulated clearly for urban planners to inform their decision-making. The costs of wetland loss and degradation should be made explicit within urban development.

**Practical principle 4:** Stakeholder engagement

- i. Urban development and wetland management should adopt the principles of inclusivity, empowerment, and participation of indigenous and local communities.
- ii. Governance of urban development and wetland management should be participatory, with all relevant stakeholders, and decentralised to the lowest appropriate level.

**Practical principle 5:** Integrated planning

- i. Thematic planning should be used as an essential tool to safeguard wetlands and their ecosystem services both within and beyond urban settlements.
- ii. The consideration of wetlands within urban planning needs to be integrated fully with wider elements of spatial planning (such as Integrated River Basin Management as adopted under Resolution X.19, water resource management, the development of transport infrastructure, agriculture production and fuel supply).



- iii. Alternative locations need to be identified for planned urban developments (both formal and informal built development) which do not lead to wetlands, or other natural ecosystems, being degraded or lost.

### Implementing the Principles for planning and managing urban and peri-urban wetlands

The Principles adopted in Resolution XI.11 provide a sound basis for ensuring the wise use of wetlands within urban and peri-urban environments. However, the principles must be implemented in towns and cities across the world if this is to happen. The Resolution includes as an appendix a list of the barriers to the wise use of urban and peri-urban wetlands, and solutions to help overcome those barriers. These are listed below with some explanatory comments.

In addition, the findings of a series of workshops addressing these implementation issues are included.

#### Drivers of wetland loss and degradation in urban and peri-urban environments

The Principles are intended “to cover the key issues facing wetlands from the pressures associated with urbanization”. An appendix to the Resolution lists the “key issues and drivers of wetland loss and degradation within and beyond urban areas which underpin the principles”. It is important to understand these issues if solutions are to be established to resolve conflicts and to implement sustainable futures:

- i. Sectoral conflicts across government departments (both horizontally and vertically) and the scarcity or absence of joined-up planning and coordination often fail to integrate wetlands appropriately in decision-making processes.
- ii. Leaving urban land use and land allocation decisions to market forces or to the customary and informal delivery systems is not a sustainable policy option and will result in continued wetland loss and degradation.
- iii. There is widespread lack of awareness about the economic and social value of wetlands and the ecosystem services they provide, both directly and in maintaining water resources upon which urban populations depend.
- iv. Lack of leadership and poor and inequitable governance are a persistent problem.
- v. There is a general lack of policies and laws to protect wetlands as well as a lack of regulatory mechanisms to enforce them.
- vi. Lack of infrastructure and financial and human resources inhibit the sustainable planning and management of urban and peri-urban wetlands.
- vii. Often there is a weak definition or understanding even of what a “wetland” is. This can be compounded by the lack of a wetland inventory to inform the urban planning process.
- viii. Populations and population density are increasing, often driven by rural poverty forcing migration to urban centres.
- ix. Climate change is a direct driver of change but also causes increasing numbers of environmental refugees to migrate to urban centres, compounding population pressures there.
- x. Poor equity of access to the benefits derived from wetland ecosystem services and endemic urban poverty can result in the over-exploitation of wetlands out of economic necessity.
- xi. Unsustainable development with illegal buildings and informal settlements, especially in proximity to the coast, and illegal activities such as dumping of waste, contribute to wetland loss and degradation.
- xii. Lack of urban waste water and sewage treatment results in pollution of wetlands directly and impacts to the aquatic environment. In addition, polluted run-off from agro-chemicals and industrial waste can also impact upon wetlands.
- xiii. Pressures on water resources for human and industrial consumption can result in water

scarcity and security issues both within and beyond urban areas.

- xiv. Wetlands are still often associated with diseases such as malaria, sometimes leading to their drainage and infilling, and there must be a greater recognition that healthy wetlands often enhance people's health and livelihoods.
- xv. Inappropriate wetland management has contributed to reducing the resilience of cities to disasters and further reducing their ability to recover from disasters.
- xvi. Extraction of geological materials beyond municipal boundaries for both building and development and to support urban populations, such as sand, salt and minerals, must be managed carefully.
- xvii. Over-exploitation of wetland resources and the [...] introduction of alien species [...] often cause loss of habitat [...].

A number of these issues reflect the lack of interest of many sectors of society and government in sustainable and equitable development, and associated issues of corruption which frequently act as a barrier to the wise use of wetlands.

### **Overcoming wetland loss and degradation in urban and peri-urban environments**

The appendix to Resolution XI.11 also spells out the following range of potential solutions to overcome these issues, which inform the Principles for the planning and management of urban and peri-urban wetlands provided in the Resolution.\* Some of the solutions can also be applied beyond the urban and peri-urban boundary but many have a particular resonance across the city-region scale.

- i. Raising the level of understanding of the broad utility of wetlands, [and the benefits that they provide society,] as this is not fully appreciated by a considerable proportion of the planning and other sectors;

\* *Comments in square brackets have been added by the author.*

- ii. Improving awareness of the benefits wetlands deliver at different levels, including teaching programmes at universities, wider public awareness campaigns, provision of targeted information across government departments [and building a network of community-based case studies that demonstrate the benefits of wetlands];
- iii. Achieving more sensitive urban planning policy development, including development frameworks and spatial zonation to protect ecosystem services (especially those of wetlands), and addressing water management issues at the appropriate scale [and developing appropriate tools and guidance to overcome implementation challenges];
- iv. Increasing the focus by governments on conserving wetland areas and, if necessary, paying people to move to other, less sensitive areas, e.g., through systems that provide payments for ecosystem services;
- v. Explicitly including wetlands as natural infrastructure in urban planning, including in landscape planning and all aspects of water management, such as storm water management, water resources and water treatment;
- vi. Treating wetlands not merely as areas that are important for nature conservation *per se* but as key elements within urban water management infrastructure and essential components in providing water resources;
- vii. Enhancing policy and legal frameworks protecting wetlands, and ensuring that they are enforced and regulated;
- viii. Using selected wetlands as natural wastewater treatment systems to mitigate urban pollution and sedimentation, particularly in improving sanitation within the limits imposed by their capacity to provide these services and without significantly compromising their ability to continue providing other ecosystem services and as long as this does not have significant adverse effects on the environment; [However, only appropriate wetlands should be selected, and standards should be set to



A degraded urban wetland, Rufisque, Senegal. © R.J.McInnes 2013

avoid misuse and further degradation and loss of these wetlands.]

- ix. Considering the wise use of wetlands both within and beyond urban boundaries and understanding the interconnectivity of catchment/watershed-scale issues including to guarantee environmental flows to wetlands;
- x. Ensuring appropriate stakeholder participation and empowerment, in both problem setting and problem solving, which can be an essential element in delivering sustainable cities – despite being essential to future successes, such engagement is currently deficient; and
- xi. Developing specific programmes aimed at benefiting and involving communities in sustainable wetland management.

In addition, the classification of wetlands should be carried out with stakeholders' involvement to empower them in decision-making regarding the use and protect-

ion of wetlands and other natural resources, in order to improve outcomes, raise awareness and manage potential trade-offs.

### Practical implementation approaches

The wise use of wetlands is essential for delivering human well-being in urban and peri-urban environments. The bodies of the Ramsar Convention such as the STRP, partner organizations such as UN-Habitat, International Organization Partners (IOPs), National Focal Points, Regional Initiatives and other networks can all help individual towns and cities achieve sustainable urbanization and the wise use of wetlands.

Through a series of workshops held in West Africa in 2013, the Ramsar Convention Secretariat, Ramsar National Focal Points, members of Ramsar's STRP and UN-Habitat have investigated the practical issues and barriers involved in implementing the Principles. The lessons to be addressed include:

**Holistic approach:** All departments within a municipality need to take a holistic and systemic approach to understanding the benefits that wetlands can provide and



ensure that these benefits are recognized and integrated into both reactive and proactive decision-making.

**Wetlands as providers of multiple benefits:** Decision-makers should ensure that wetlands are protected and restored as providers of multi-benefit solutions to urban and peri-urban issues as well as for the important biodiversity they support.

**Informing all stakeholders:** The many different communities within towns and cities will require information on the wise use of wetlands to be presented in a variety of formats with different emphasis. Three priority audiences have been highlighted from the work conducted in West Africa:

i) city mayors, senior elected officials and traditional elders, who require information on why the protection and restoration of wetlands delivers benefits to urban citizens;

ii) heads of municipal departments and their senior technical staff, who require information on why the protection and restoration of wetlands delivers benefits to urban citizens and also on how these benefits can be recognized and integrated into spatial and temporal urban planning and management;

iii) wider members of civil society, who need to understand better why the protection and restoration of wetlands delivers benefits to urban citizens but also how day-to-day actions can help deliver the sustainable future that they want.

**Practical guidance and examples:** Practical guidance needs to be developed for the various audiences, which conveys the policy and practical principles for the wise use of urban and peri-urban wetlands in the appropriate language using the most relevant and accessible media. Developing demonstration sites which people can visit and understand is encouraged, as is the use of social media and video technology to capture and relay key messages about wetland wise use.

**Local knowledge:** No two cities or towns are the same. Understanding the unique context of a town or city and recognizing different opportunities is critical. Different urban processes or solutions, such as zoning, densification and compactness, should be considered in tandem with the development or protection of natural infrastructure such as wetlands.

## Conclusion

Urban and peri-urban areas are human constructs which have the power to drive local, national and global prosperity. Wetlands deliver a vast range of benefits to human society. Through appropriate planning and management the wise use of wetlands in urban and peri-urban environments can secure these benefits and contribute to delivering sustainable urbanization for future generations.

## References

Adelekan, I.O. (2009). Vulnerability of Poor Urban Coastal Communities to Climate Change in Lagos, Nigeria. *Paper presented at the Fifth Urban Research Symposium, Marseille, France. 28-30 June 2009.*

Best Foot Forward (2002). *City Limits: a resource flow and ecological footprint analysis of Greater London.* Oxford, UK: Best Foot Forward Ltd.

Bolund, P. & Hunhammar, S. (1999). Ecosystem services in urban areas. *Ecol Econ.* 29, 293-301.

Bolca, M., Turkyilmaz, B., Kurucu, Y., Altinbas, U., Esetlili, M.T., Gulgun, B. (2007). Determination of impact of urbanisation on agricultural land and wetland land use in Balçovas' Delta by remote sensing and GIS technique. *Environ. Monit. Assess.* 131, 409-419.

Booth, D. B. & Jackson, C.R. (1997). Urbanization of aquatic systems: degradation thresholds, stormwater detection, and the limits of mitigation. *Jnl. Amer. Wat. Res. Assoc.* 33, (5), 1077-1090.

Chapagain, A.K. & Hoekstra, A.Y. (2003). Virtual water trade: a quantification of virtual water flows between nations in relation to international trade of livestock and livestock products. In Hoekstra, A.Y. (Ed.) *Virtual water trade Proceedings of the International Expert Meeting on Virtual Water Trade.* Value of Water Research Report Series No. 12, 49-76. Delft, The Netherlands: IHE.

Darnell, R.M. (1976). *Impacts of Construction Activities in Wetlands of the United States.* EPA-600/3-76-045. Corvallis, OR: U.S. Environmental Protection Agency, Environmental Research Laboratory.

Emerton, L. & Bos, E. (2004). *Value. Counting ecosystems*

- as an economic part of water. Gland, Switzerland, and Cambridge, U.K: IUCN.
- Emerton, L., Iyango, L., Luwum, P. & Malinga, A. (1998). *The Present Economic Value of Nakivubo Urban Wetland, Uganda*. 30pp. Nairobi, Kenya: IUCN, Eastern Africa Regional Office, and Kampala, Uganda: Uganda National Wetlands Programme, Wetlands Inspectorate Division, Ministry of Water, Land and Environment.
- Everard, M., Joll, H., & Donnan, A. (eds.) (2008). Water, wildlife and people. *Env. Sci.* 17 (3), 2-3.
- Faulkner, S. (2004). Urbanization impacts on the structure and function of forested wetlands. *Urb. Ecosys.* 7, 89-106.
- Gerrard, P. (2004). *Integrating Wetland Ecosystem Values into Urban Planning: The Case of That Luang Marsh, Vientiane, Lao PDR*. 35pp. Vientiane, Lao PDR: IUCN, Asia Regional Environmental Economics Programme and WWF Lao Country Office.
- Gerrard, P. (2010). *Technical overview, the WATER project's pilot constructed wetlands and lessons learned*. Vientiane, Lao PDR: WWF, Laos.
- Hollis, G.E. (1990). Environmental impacts of development on wetlands in arid and semi-arid lands. *Hydro. Sci. Jnl.*, 35 (4), 411-428.
- ICLEI – Local Governments for Sustainability. Laros, M.T. & Jones, F.E. (Eds). (2010). *Local Action for Biodiversity Guidebook: Biodiversity Management for Local Governments*. 158pp. Melbourne, Australia: International Council for Local Environment Initiatives (Pty) Ltd.
- Kareiva, P., Watts, S., McDonald, R. & Boucher, T. (2007). Domesticated nature: shaping landscapes and ecosystems for human welfare. *Science*, 316, 1866-9.
- Keddy, P.A. (1983). Freshwater wetlands human-induced changes: indirect effects must also be considered. *Env. Mgt.*, 7 (4), 299-302.
- Kingsford, R.T. (2000). Ecological impacts of dams, water diversions and river management on floodplain wetlands in Australia. *Austral Ecology*, 25 (2), 109-127.
- Lannas, K. S. M. & Turpie, J. K. (2009). Valuing the provisioning services of wetlands: contrasting a rural wetland in Lesotho with a peri-urban wetland in South Africa. *Ecol. and Soc.* 14 (2), 18.
- Lee, S. Y., Dunn, R. J. K., Young, R. A., Connolly, R. M., Dale, P. E. R., Dehayr, R., Lemckert, C. J., McKinnon, S., Powell, B., Teasdale, P. R., & Welsh, D.T. (2006). Impact of urbanisation on coastal wetland structure and function. *Austral. Ecol.* 31 (2), 149-163.
- Maltby, E. (1986). *Waterlogged Wealth: Why Waste the World's Wet Places*. London, UK: Earthscan .
- McGranahan, G., Balk, D. & Anderson, B. (2007). The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones. *Env. and Urban.* 19 (1), 17-37.
- McInnes, R.J. (2013). Recognising wetland ecosystem services within urban case studies. *Mar. Fresh. Res.* 64, 1-14.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being: wetlands and water synthesis: a report of the Millennium Ecosystem Assessment*. 68p. Washington DC, USA: World Resources Institute.
- Pauchard, A., Aguayo, M., Peña, E. & Urrutia, R. (2006). Multiple effects of urbanization on the biodiversity of developing countries: The case of a fast-growing metropolitan area (Concepción, Chile). *Biol. Con.* 127 (3), 272-281.
- Ramsar Convention Secretariat. (2010). *Wise use of wetlands: Concepts and approaches for the wise use of wetlands*. Ramsar handbooks for the wise use of wetlands, 4th edition, volume 1. Gland, Switzerland: Ramsar Convention Secretariat.
- Rees, W. E. (1992). Ecological footprints and appropriated carrying capacity: what urban economics leaves out. *Environ. and Urban.* 4 (2), 121-130.
- Rees, W. & Wackernagel, M. (1996). Urban ecological footprints: why cities cannot be sustainable – and why they are a key to sustainability. *Environ. Impact Assess. Rev.* 16, 223-248.
- Tong, C., Feagin, R.A., Lu, J., Zhang, X., Zhu, X., Wang, W. & He, W. (2007). Ecosystem service values and restoration in the urban Sanyang wetland of Wenzhou, China. *Ecol. Eng.* 29 (3), 249-258.

UN-Habitat. (2012). *Urban Patterns for a Green Economy: Working with Nature*. Nairobi, Kenya: UNON, Publishing Services Section.

Wackernagel, M., Kitzes, J., Moran, D., Goldfinger, S. & Thomas, M. (2006). The Ecological Footprint of cities and regions: comparing resource availability with resource demand. *Environ. and Urban.* 103, 18 (1), 103-112.

White, M.D. & Greer, K.A. (2006). The effects of watershed urbanisation on the stream hydrology and riparian vegetation of Los Peñasquitos Creek, California. *Land. Urb. Plan.* 74 (2), 125-138.

Zedler, J.B. & Leach, M.K. (1998). Managing urban wetlands for multiple use: research, restoration, and recreation. *Urb. Ecosys.* 2, 189-204.

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