Thinking outside the pipe

Rainwater harvesting workshop series resonates with British Columbians

By Kim Stephens and Colwyn Sunderland

Drawing on the experience of two international experts, workshops held in Vancouver on May 31 and in Victoria on June 20 connected the dots between *why* harvest rainwater and *how* to cost-effectively implement rainwater collection, storage, treatment and delivery systems. The workshops were organized by a partnership comprising BCWWA, Canada Mortgage & Housing Corporation (CMHC), Province of BC, Capital Regional District and Canadian Water Resources Association (CWRA). The two events were undertaken within the context of the Water Sustainability Action Plan for British Columbia, which is enabling the Province to collaborate with local government and others to advance a shared vision for water stewardship and sustainable communities. The workshops were accredited for continuing professional development by the Association of Professional Engineers and Geoscientists of BC (APEGBC), Architectural Institute of BC (AIBC) and Planning Institute of BC (PIBC).

Why harvest rainwater?

The population of the Georgia Basin is predicted to double within the next 50 years. Our traditional water supply and wastewater systems are already stretched to serve immediate needs, and a changing climate is expected to reduce the capacity of our water supplies as our population grows. We now recognize that total water resources are physically bounded. At the same time, rainwater runs off urban roofs and landscapes in large volumes, only to be promptly and wastefully whisked away by sewers. The old approach of "super-sizing" infrastructure is no longer sustainable.

Enter the concept of rainwater harvesting; collecting water that falls exactly where it is needed. This elegantly simple, self-sufficient strategy has the potential to dramatically reduce demand on central water supplies without multi-million dollar capital projects. Locally harvested rainwater already provides a large proportion of the water used for agriculture in the Georgia Basin, as well as some large industrial operations,

and it is the sole water source for many residents of the Gulf Islands and Howe Sound islands. Rainwater harvesting is growing as a component of sustainable development in BC, however, its economic value as a water supply planning strategy for our urban areas is not well understood.

Two workshops, two perspectives, and one common vision

Although the Vancouver and Victoria workshops followed the same format, the content and emphasis of each event was different. The workshops explored rainwater harvesting from both the *Green Building* and *Water Management* perspectives. Rainwater harvesting is widely used as an urban water management strategy in Australia and Japan, and is gaining a strong foothold in Europe. This was not always the case.

Speaking to a Vancouver audience of 86 dominated by green building professionals, Australian engineer, microbiologist and water management expert Dr. Peter Coombes described his long uphill battles to convince water utility managers and public health officials that rainwater harvesting is both cost-effective and safe. The same myths that he has largely overcome in Australia are widely held in North America: Rainwater is dirty, rainwater harvesting systems are too expensive, and it's cheaper to expand municipal supplies. In discussion of local examples, Coombes challenged the delegates to work together to overcome the perceived barriers by designing according to water management objectives, simplifying wherever possible, establishing appropriate standards, and convening for action.

In Victoria, Klaus König shared his globetrotting experience as an architect, engineer and sustainable urban design expert with a diverse audience of 58 delegates that included public health professionals, politicians, biologists, journalists, builders and planners in addition to architects and engineers interested in green building. From a substantially different perspective, König reached ostensibly the same conclusions as Coombes: Overcoming the institutional and economic barriers to rainwater harvesting requires designing appropriately for end uses, establishing standards, simple and pre-packaged systems, and above all, fostering cooperation.

A future for urban rainwater harvesting in BC

The rainwater harvesting workshops have produced immediate results. Delegates left the workshops with a new understanding of the similarities in the challenges we now face in BC to those that Australians, Germans, Japanese and others are beginning to overcome through innovations such as rainwater harvesting. New relationships forged around key issues at the workshops have already resulted in sharing of information such as draft guidelines for design of rainwater systems. Local, provincial and federal authorities have begun working to achieve consensus on appropriate standards. Many of the workshop delegates have expressed interest in future workshops on rainwater harvesting.

These are promising beginnings. However, much work is needed to determine how rainwater harvesting fits into the complex puzzle of sustainable resource management in BC. An important example raised in the closing remarks of the workshops is the water-energy nexus. The energy vested in water that is delivered to an urban customer is a significant component of both its economic and environmental cost. The concepts underlying the green building movement centre around reducing the energy consumed in the life cycle of a building. For an architect or engineer designing a green building to make meaningful decisions about water using systems in the building, the energy demand of treating and conveying locally harvested rainwater must be measured against the energy demand of municipal water. End uses should be matched to the available sources to avoid unnecessary treatment for uses such as landscape irrigation or toilet flushing. Rainwater systems should be designed for optimum efficiency; simple and passive technologies should be used wherever possible. The highest quality water should be reserved for the end uses that require it. This example illustrates the need for all stakeholders in the evolution of our urban infrastructure to work together.