Public Health Policy Implications for Stormwater Reuse in Victoria

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ABSTRACT

The value of stormwater run-off as a beneficial resource for urban amenity is gaining momentum. The driver for this interest is the mounting evidence that our health is intrinsically linked to the environment in which we live. Access to natural and quality built environments is good for health and wellbeing as it is likely to increase rates of physical activity, and reduce chronic disease, obesity, and poor mental health.

While stormwater infrastructure must fulfil its primary function of safely taking excess stormwater away from the built environment, policy makers are now asking questions about where it can be utilised to augment drinking water and how can it be used to improve health and wellbeing.

The introduction of a new water source such as stormwater for uses where it will be at risk of ingestion by a broader population raises an interesting challenge for public health policy.

The use of stormwater in the built environment is not recognised in current public health water policy. The current policy is designed around safety systems for traditional drinking water supplies. The potential for stormwater to be reused in the spaces where people live raises issues about impacts or conflicts with related legislations. It is therefore important that future policy frameworks align to enable greater up take of stormwater in a way that effectively balances safety issues, protects public health, and allows behaviours that promote public health.

1. INTRODUCTION

Since the 1990s, stormwater and wastewater has been managed with the fundamental driver being to protect receiving water environments and, as a result, they have been widely utilised for irrigation of crops and pastures. This is no longer considered the only use for these alternative water sources. In the case of stormwater a range of innovative opportunities exist for greater uptake. Population growth and climate change have created the impetus to reduce demands on potable water supplies. Stormwater has been touted as a realistic alternative to many uses. It is acknowledged that there is a correlation between health status and the environment in which we live. For this reason water systems that effectively integrate stormwater harvesting and water sensitive urban design (WSUD) in to future planning scenarios will enable improved population health outcomes.

Public health is not only about facilitating safe and sustainable initiatives to protect the community from hazards in water, it also aims for improved health outcomes. Therefore, creating healthy places as an investment in health and wellbeing by the incorporation of alternative water sources to irrigate public spaces, can enhance active and passive recreation opportunities as well as provide water for shade trees, and increase the amount of localised greenery needed to create cooler urban spaces.
While it may seem contradictory to health protection considerations when a new alternative water source is utilised we now recognise there are benefits in retaining stormwater in the urban environment where people live. Historically stormwater was separated from buildings in order to keep people safe, however as a contributor to healthy environments, the use of stormwater requires a risk based approach to ensure public health remains protected from water-borne pathogens and chemicals.

Future uses need to align with the intention of the policies that are in place to ensure public health is not compromised. Moving from low exposure uses of stormwater to more complex systems with high exposure uses requires an understanding of strict risk management practices. Therefore if stormwater harvesting is to be successful it must be ‘fit for purpose’ from both a public health protection and prevention aspect.

2. PUBLIC HEALTH POLICY

Public health is a dynamic field. Historically it has been associated with controlling communicable diseases and improving unsanitary and unsafe conditions in the community. Public health now encompasses the broader dimensions of social health, health promotion and health advancement. The separation of sewage from drinking water is an example of health protection. The move to integrated water management systems to achieve more resilient and liveable cities, in response to population growth and climate change, is an example of a measure that can achieve broader public health goals.

The major causes of population ill-health in Australia today are those conditions related to lifestyle diseases including cardiovascular disease, cancers, diabetes and respiratory disorders. Many of these conditions are, in principle, preventable, because of their relationship with high risk factors such as smoking, inadequate physical activity, obesity, and poor nutrition. Where lifestyle is an important factor in determining health status, it is important to recognise that the choices available to the individual are either promoted or constrained by their physical, social and economic environment.

It is important to promote public health and wellbeing through the built, social, economic and natural environments in order to address health inequalities. For instance, provision of alternate water supplies for green infrastructure can provide access to green-space which can provide health benefits to a community. While lack of access can also contribute to a greater disadvantage of already vulnerable populations (Pyper, 2004).

Many sectors play an equally important and complementary role in protecting and promoting health and preventing injury across a variety of settings. Therefore, it is important that public health and related legislation complement and reinforce each other, and should do so without inconsistencies and unnecessary duplication.

3. PUBLIC HEALTH POLICY IN VICTORIA

The Public Health and Wellbeing Act, 2008 (PHWBA) is the principal legislation that sets policy about the promotion and protection of public health and wellbeing in Victoria. It requires the Department of Health to respond to communicable diseases and environmental risks as well as develop supporting programs to promote and advance broader public health initiatives. This includes strategies aimed at reducing the most significant public health issues faced by modern societies, known as lifestyle diseases (Dept. Human Services, 2004).
Administration of the PHWBA requires consideration of guiding principles. These include evidence based decision making, collaboration, the precautionary principle and primacy of prevention. In particular, primacy of prevention means ‘Preventing harm or damage is preferable to repairing it later. Promoting resilience and building capacity is preferable to allowing deficits or problems to otherwise undermine health or autonomy’ (Dept. Human Services, 2005).

A key requirement under the PHWBA is Victoria’s Health and Wellbeing Plan, released in 2011, which aims to build a ‘Victoria-wide prevention system complementary to the healthcare system’. This plan is relevant to stormwater reuse as it commits to:

- The appropriate management of use of all water resources and preventing illness from inappropriate exposure to alternative water sources

and

- Create environments that support healthy choices

This will be achieved by

- building prevention infrastructure to support evidence-based policy and practice
- integrating state-wide policy and planning to strengthen public health and wellbeing interventions
- developing leadership and strengthening partnerships to maximise prevention efforts across sectors
- tailoring interventions for priority populations to reduce disparities in health outcomes.

Furthermore, the Victorian health system is recognised as being much more than public hospitals. The Victorian Health Priorities Framework 2012 – 2022 (VHPF) is designed as a roadmap for health reform through long term planning for Victoria’s health system and includes a requirement to invest in prevention.

Therefore, the VHPF supports development of water strategies to use alternative water supplies in the urban landscape to improve liveability and achieve better health outcomes. Strategies that incorporate alternative water sources to irrigate public spaces to enhance active and passive recreation activities as well as to water shade trees, increase the amount of greenery and therefore create cooler urban spaces are encouraged.

Successful prevention efforts require a ‘health in all policies’ approach and therefore Victoria’s regulatory environment forms part of Victoria’s integrated prevention system. In addition the fundamental aims of health protection must be maintained. The concept of using water that is fit for purpose is the foundation of the risk hierarchy, which underpins public health policy. That is the quality of stormwater and the associated management controls need to be proportional to the level of risk associated with exposure.
Public Health – Prevention/Promotion

To date the construction of stormwater harvesting projects has occurred according to the availability of funding. However, it is important that future stormwater management is strategically aligned. The next stage of stormwater management should focus on total water cycle management, integrated land and water management together with the associated public health benefits.

Integrating recycled stormwater uses with land planning to link key destinations through linear parks along urban watercourses is an example. While the management of the risks and impacts of flooding are maintained, the provision of quality open spaces will contribute to health improvement goals. The *Stormwater Management in a Water Sensitive City: Blueprint 2011*, encourages planners to adopt designs so that ‘stormwater flow is conveyed through a series of green/blue corridors that serve as open spaces and productive landscapes that also detain flood water for flood protection of downstream communities.’

The Department of Health recognises access to secure, safe water supplies is a fundamental determinant of health. For example, water has a role in the local production of fresh food; employment in high water use industries; provision of quality spaces in which to be physically active; and green urban infrastructure to mitigate urban heat islands and provide active transport routes. All these factors need to be considered when planning and designing our towns and suburbs. Planning for co-location of high use fit-for-purpose water uses is an aspiration that should be given serious consideration.

Another example of health benefits is through creating cooler urban spaces, especially if targeted at areas where there is a recognised need to protect communities from this environmental health threat. The recent *Inquiry into Environmental Design and Public Health in Victoria* highlights urban heat islands as an emerging risk in our cities and towns and therefore encourages measures to mitigate the effects.

Public Health - Protection

Separating water from sewage has been instrumental in reducing waterborne disease. Engineered drainage systems for fast removal of stormwater has also been a successful public safety measure. As Hatton et al (2004, p19) highlights, ‘Protecting health is an important message that cannot be lost in discussions of using alternative sources of water’. Victoria has a good record of reducing the incidence of water related illness and new sources of water must not undermine this record.

Stormwater harvesting may be able to contribute to our water security by providing a range of water products from a range of sources. However, the end use, location of schemes, volumes harvested, storage options and prevailing hydro-geological conditions should be carefully considered in accordance with the risk hierarchy principles (Dept for Water, 2011).

Using water that is fit-for-purpose has numerous benefits. For example, using lower quality water for irrigating open spaces reduces the demand on high quality potable water supply. There are also major cost and energy savings in treating water to a lower-quality level if it is being used for non-potable purposes. It should be noted that most existing treatment options are not good at dealing with rapidly changing source water quality (Dept for Water, 2011).
4. NATIONAL CONSIDERATIONS FOR STORMWATER

As a part of the overall reforms for water, the Council of Australian Governments (COAG) and the National Water Commission acknowledge and encourage the development of stormwater reuse. The Department of Sustainability, Environment, Water, Population and Communities has developed principles for urban water planning which are relevant to public health considerations of stormwater reuse.

In particular the principles of using a portfolio of water supply and demand options and the urban context of a whole-of-water-cycle basis, consider both elements of public health. For example, a portfolio of supply and demand options should examine and aim to optimise the social, environmental and economic outcomes. The whole of water cycle approach requires understanding of the risks associated with different parts of the urban water cycle that should be considered and managed. Consideration of these aspects can deliver diverse, fit-for-purpose, water supplies while optimising the use of water at different stages of the urban water cycle.

5. STORMWATER POLICY IN VICTORIA

Until recent times stormwater was not considered to be an alternate source of water. However, the introduction of this water source to the suite of water resources now available means policies have been developed to inform end-users. Initial policies were developed with the primary aim of controlling quality and quantity to receiving waterways and demonstrating protection of the environment.

In Victoria the use and required quality of stormwater is not specifically regulated. It is expected that proponents responsible for stormwater schemes fulfil a duty of care to make sure their scheme will not cause harm to people or the environment. The Australian Guidelines for Water Recycling (Phase 1 and 2) establishes a standard for protecting both public health and the environment and these guidelines are recommended in Victoria for the reuse of stormwater. We must also be aware there may be unintended uses of stormwater. Therefore guidance is necessary to proponents developing new sources of water to do so in a way that is safe for the intended uses.

In 2009, the Review of the regulatory framework for alternative urban water supplies identified stormwater recycling in Victoria would most likely be limited to a household property scale or to applications with large storages for opportunistic reuse, for example irrigation of adjacent parkland and sports fields. The review recommends the use of stormwater be supported by relevant guidance including the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) – Stormwater Harvesting and Reuse rather than specific regulation.

However, since 2009 additional uses of stormwater have been proposed including its use in large-scale dual pipe residential developments. The potential for stormwater to be reused in spaces where people live raises considerations for impacts on public health. High exposure applications introduce the potential for high, uncontrolled health risks. This prompts further questions about whether any changes are needed to the current stormwater management framework. This is currently under review to consider if stormwater reuse should be aligned with similar policies in place (such as recycled water) to protect public health.

Localised stormwater harvesting is a mechanism that assists with water supply while contributing to the urban amenity. Integrated water management strategies are a mechanism that can demonstrate
appropriate use of stormwater. These strategies should focus on appropriate uses in the urban landscape to achieve better health and wellbeing outcomes while ensuring appropriate measures are adopted to protect health.

The recent independent report, Living Melbourne Living Victoria (LMLV) Implementation Plan aims to ‘make optimal use of all water resources’, including stormwater, and has provided advice to government to achieve:

An integrated, resilient water system that is planned and managed to

- support liveable and sustainable communities
- protect the environmental health of urban waterways and bays
- provide secure water supplies efficiently
- protect public health
- deliver affordable essential water services.

The LMLV plan acknowledges the links between water and urban amenity/liveability and recognises the water sector has a role to play. The plan proposes as approach to create better linkages between water planning and urban planning. This will be undertaken through a Metropolitan Integrated Water Cycle Strategy (MIWCS) linked with subregional Integrated Water Cycle Plans (IWCP) which will consider broad community needs with the water planning framework.

6. DISCUSSION

While the LMLV implementation plan encourages the water sector to identify with the concept of liveability it is also a mechanism to contribute to public health policy. Even though it acknowledges there is no established, uniform definition of liveability, it recognises community wellbeing. This is in line with the State Health and Wellbeing plan which emphasises the promotion of wellbeing and prevention of disease.

Similar to the water strategy and water cycle plans, the State Health and Wellbeing plan also links to local planning processes. The municipal public health and wellbeing plans. are the primary strategic planning mechanism for public health and wellbeing efforts at the at the local government level. The connection of an overarching high level strategy to local plans in order to improve public health demonstrates synergies with the proposed water – urban planning strategies.

There are many opportunities for cross sector collaboration. Convergence of water planning and urban planning can provide an opportunity to redesign water systems with other city services which can contribute to healthy urban spaces and provide numerous additional benefits (Binney et al, 2010). Better management of water, utilising various types of green infrastructure, can create urban environments that are cooler and provide more opportunities for people to be active in the urban landscape. Integrating strategies that shape our cities such as active transport routes; healthy spaces for recreation, community scale revegetation, and co-locating fit-for-purpose water schemes with high water use community and industry activities will contribute to social cohesion and a more resilient economy.
7. CONCLUSION

Public health policy relies upon protection from hazards and investment in prevention. Analysis of public health policy and stormwater policy in Victoria demonstrates there are common attributes between both. The shift to linking a high level strategy to (sub) regional plans is an example. These water strategies however are limited with respect to ‘liveability’ as they have a predominant focus on the environment. To incorporate liveability, water strategies need to demonstrate how water can be utilised as an element to underpin healthy environments. Stormwater is the most accessible community based water resource to maintain and enhance open spaces and green corridors. It can underpin good quality recreational spaces and can also contribute to healthier communities through the use of water sensitive urban design to help mitigate the urban heat island effect.

The department is responsible for monitoring, identifying, managing and responding to key public health risks and emergencies, this includes the safe use of alternative water sources to both protect and enhance public health and wellbeing.

We look forward to continuing our conversations within the water sector with the goal of improving liveability in our cities and towns and acknowledging both aspects of public health, prevention and protection in future strategies especially those linked with planning.
REFERENCES


