

Freshwater Ownership, Allocation and Pricing

by

Karla Smith

Topic 2: Considering the challenges facing the demand for freshwater across economic, social and environmental needs, should New Zealand introduce a national pricing system for freshwater use? The essay would also need to address the pre-requisites for an efficient pricing system and identify any barriers in the New Zealand context.

Word count: 1,962

Freshwater is one of New Zealand's precious natural resources. It impacts the lives of every New Zealander, and its use needs to be managed in order to ensure sustainable levels are taken from lakes, rivers, and groundwater. The current system for freshwater usage allocation is regional; local councils have responsibility for managing freshwater in their region, and they allocate permits out to users on a first-come first-served basis. This existing system is not consistent or efficient, and it is proposed that a national system be implemented. Importantly, the national system should set national standards and priorities, as well as allowing the trade of permits, to encourage efficient water usage.

New Zealand's Freshwater Resource

On a global scale New Zealand has significant freshwater resources – only Iceland has a higher quantity of renewable freshwater resource per capita when compared to 33 other OECD countries (OECD, 2015). However, both New Zealand's rainfall and its groundwater stocks are unevenly distributed: for example, most of Central Otago has on average less than 1,000 mm/ year of rain, whilst Fiordland has on average over 5,000 mm/year of rain (Statistics New Zealand, 2015a). Furthermore, it is estimated that Canterbury has over 70% of the country's groundwater volume (Statistics New Zealand, 2015b). This uneven distribution means that despite New Zealand's overall abundance of freshwater, much of it is not where it is most needed (Ministry for the Environment, 2010a). There is particular pressure on the freshwater resource in Otago, Canterbury and Marlborough (Ministry for the Environment, 2010b). If unmanaged, freshwater is subject to the tragedy of the commons; thus a management strategy is necessary to prevent over-use.

The Living Standards Framework

The New Zealand government has to balance a number of factors that impact the well-being of New Zealanders. Economic growth is one of these factors, but sustainability for the future is equally important, as is increasing equity, managing risks, and social cohesion (New Zealand Treasury, 2016). These are all relevant when considering the use of New Zealand's freshwater: freshwater is an input for a number of major industries (e.g. farming, power generation, tourism), and is therefore an important component for economic growth. It should also be used sustainably, to ensure a suitable supply for future generations; its distribution should ideally be equitable; and there are risks associated with overusing it: if over-used there may be insufficient water available for native flora and fauna, leading to extinctions. Finally, it is a significant component of numerous outdoor social activities (e.g.

fishing, kayaking, swimming), as well being a resource of importance to Māori as tāngata whenua (Gleisner, Llewellyn-Fowler, & McAlister, 2011).

Freshwater is a significant aspect of New Zealand's natural capital (Gleisner, Llewellyn-Fowler, & McAlister, 2011), and thus needs to be carefully managed to ensure that all factors of the Living Standards Framework are taken into account when it is allocated to users.

The Existing Freshwater Management System

Currently in New Zealand the responsibility for freshwater management is distributed – the regional councils are responsible for freshwater allocation in accordance with the Resource Management Act 1991 (RMA) (Memon & Skelton, 2007). The process allocates freshwater usage rights on a first-come first-served basis, and whilst the RMA allows the transfer of water permits between users, this is not widely used (Hudspith, 2012).

In theory a distributed system should work well, as each region should have the best knowledge of its own environment and associated challenges. However, the first-come first-served nature of the system, combined with the lack of permit transfers, means that freshwater supplies are not being used in the most efficient way. In 2010, it was estimated that only around 65% of allocated water was actually used. Most regions used less than 50% of their maximum allocated water, whilst Gisborne used almost twice as much as was allocated (Ministry for the Environment, 2010a). More recently, it has been shown that millions of litres of unconsented water was taken in Canterbury (Forest and Bird, 2016), with the regional authority doing little monitoring, and even less enforcement (Mitchell, 2016).

If it is assumed that the maximum allocation is at the highest sustainable level for freshwater use, then some regions are significantly under-using this resource, while others are over-using it. As a result, economic growth is not being maximised, and sustainability is not assured. Furthermore, the first-come first-served nature of the system means that existing permit holders do not have an economic incentive to conserve water freshwater distribution (OECD, 2007), nor is the distribution necessarily equitable. For example, more efficient users may be denied a permit, as the whole allocation has already been given out (Kaye-Blake, Schilling, Nixon, & Destremau, 2014).

In 2010, the largest use of our allocated water is irrigation (46%), with the Manapouri hydro take being a close second (41%). Irrigation use increased by 10% from 1996 to 2010 (Ministry for the Environment, 2010a), and has most likely further increased since then. There are a few places in New Zealand that charge for water use (e.g. Auckland City); in these areas water use has significantly decreased (Parliamentary Commissioner for the Environment, 2001, as cited in OECD, 2007).

The existing system also means that Māori claims to freshwater are not consistently dealt with. Under the Treaty of Waitangi, Māori claim ownership of New Zealand's water resources; this complicates the allocation of freshwater rights (Memon P. A., 1997).

Implications and Pre-requisites of a National Approach

Centralising the management of freshwater rights would ensure a consistent approach across the regions. It would also allow a redesign of the system for allocating freshwater usage rights, with national standards and priorities implemented. In order to decide upon the optimal system, various factors need to be taken into account, such as administrative costs, the political implications, and the effect on externalities. It is important that the varied regional environments are still accounted for, so that sustainable levels of freshwater are allocated.

In order to reduce administrative and compliance costs, the proposed national system should be simple to run and use. A new management system should also limit the scope for users to avoid it, and monitoring should be at a suitable level to ensure compliance with permit allocations. Penalties for taking excess freshwater would need to be set such that there is no economic incentive for users to take more than their allocation, based on the expected probability of being caught and penalised.

Historically New Zealanders have had free access to freshwater, and there may be a political backlash against requiring payment for it. Despite this, there is evidence that New Zealanders are willing to pay a small amount per person for improved water quality (Cullen, Hughey, & Kerr, 2006). Whilst paying for improved water quality is not the same as charging users for volume of water usage, it is a related issue, and indicates that freshwater is a topic of concern to New Zealanders.

As well as the potential political implications of requiring users to pay for the freshwater they use, requiring payment could have serious economic implications for farmers and other high-volume users; increased costs would result in either increased product prices or decreased profits. As most of New Zealand's agricultural output is exported, and prices need to be competitive on the international market, a price rise may not be feasible. If non-trivial charges were to be implemented for freshwater usage, this would need to be phased in, and ideally offset by a reduction in other costs. For example, rates should decrease, as regional councils would no longer be managing water allocation.

The existing system means that those with water use permits have certainty on the availability of water (since the permits are for up to 35 years, and are usually renewed upon expiry). This certainty means that commercial users are able to undertake significant capital investment, with a low risk of losing any required water resource (Hudspith, 2012). This certainty should be retained if possible.

The externalities associated with freshwater usage should also be taken into account in any new system, ensuring a more equitable allocation of the resource. In some regions significant quantities of freshwater are taken from sources also used for recreation and other non-commercial activities, but these interests are not as valued as commercial ones (Hudspith, 2012). Thus the negative externalities on non-commercial users are not necessarily given sufficient weight, and any new system should ensure these are taken into account in a consistent manner.

The potential administrative, political, and economic costs of a national pricing system for freshwater use should all be minimised. On the positive side, a new system should allow more efficient use of water than the current one, potentially allowing for increased economic output overall. National standards and priorities would mean more consistency in water allocation.

Proposed National System

The first priority for a national system of freshwater allocation should be to determine the sustainable level of water allocation from each individual water source. To account for the different levels of water available in different years, (due to differing amounts of rain and snow,) each maximum sustainable allocation should have discrete levels based on water

inflows, not just a constant figure per year. The maximum sustainable level should take into account not just future water usage, but also the required water levels for environmental health, and social and recreational use.

Once the maximum has been determined, permits could be allocated based on the lower of historical usage and the current permit allowance. This would allow existing permit holders certainty regarding their supply, while returning any unused water usage to the central authority. If this would result in an over-allocation of freshwater, then a customised solution should be looked at to reduce the overall water allocation from that source. Existing users should be given these permits, rather than having to buy them, as purchasing them would be an unexpected cost, and would have negative political implications.

In order to target reductions in water allocation in dry years, permits should have a priority associated with them (Land and Water Forum, 2015). Initially these should be allocated out based on the activity for which the water will be used (e.g. drinking water would be high priority). High priority permits would have no decrease in their allocation, regardless of water levels, while low priority permits would get their usage cut by a percentage to ensure sustainable use.

For each region, local iwi should be involved in this process to ensure their rights are being taken into account.

Finally, a market should be created allowing these permits should be traded. According to the Coase theorem, when property rights are defined, and trading costs are low, an efficient outcome will occur, regardless of the original allocations. Each permit should be linked to a particular water source, meaning water permits in Central Otago would have a higher value than those in Taranaki, reflecting the scarcity (or abundance) of supply for that particular source. This would further encourage water conservation in those regions that need it the most.

Any unused permits should be placed on the market for purchase by new or existing users. Existing users should also be able to easily buy and sell permits, giving them a motivation to increase water efficiency.

The proposed system should allow for an allocation of freshwater resources that is less risky, more sustainable, and more equitable than the current system. Economic growth would be encouraged, while incorporating the needs of the environment, and the desires of the recreational users and Māori. In contrast, the existing first-in first-served system, managed by regional councils has inconsistencies in the allocation, is not maximising economic growth, and is also not always achieving sustainability. A national system for initially allocating, and then trading permits would give consistency to the freshwater allocations throughout the country, whilst improving the outcomes in accordance with the Living Standards Framework.

References

- Cullen, R., Hughey, K., & Kerr, G. (2006). New Zealand freshwater management and agricultural impacts. *The Australian Journal of Agricultural and Resource Economics*, 50(3), 327-346. doi:10.1111/j.1467-8489.2006.00338.x
- Forest and Bird. (2016, June 24). *Billions of litres illegally taken from Canterbury's waterways*. Retrieved July 2016, from <http://www.forestandbird.org.nz/what-we-do/publications/branch-newsletters/billions-litres-illegally-taken-canterburys-waterways>
- Gleisner, B., Llewellyn-Fowler, M., & McAlister, F. (2011, May 21). *Working Towards Higher Living Standards for New Zealanders*. Wellington: New Zealand Treasury. Retrieved July 2016, from Natural Capital: <http://www.treasury.govt.nz/publications/research-policy/tp/higherlivingstandards/16.htm>
- Hudspith, E. (2012). Freshwater management in New Zealand: A challenge for ecology, equity, and economic efficiency. *New Zealand Journal of Environmental Law*, 16, 277-317.
- Kaye-Blake, B., Schilling, C., Nixon, C., & Destremau, K. (2014, March 18). *Water management in New Zealand: A road map for understanding water value*. Retrieved July 2015, from NZIER - New Zealand Institute of Economic Research: https://nzier.org.nz/static/media/filer_public/d2/ce/d2cef6fa-3b58-4f11-bb0b-7b2a684ac181/nzier_public_discussion_paper_2014-01_-_water_management_in_nz.pdf
- Land and Water Forum. (2015). *The Fourth Report of the Land and Water Forum*.
- Memon, A., & Skelton, P. (2007). Institutional arrangements and planning practices to allocate freshwater resources in New Zealand: A way forward. *New Zealand Journal of Environmental Law*, 11, 241-277.
- Memon, P. A. (1997). Freshwater management policies in New Zealand. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 7, 305-322.
- Ministry for the Environment. (2010a, December 01). *Freshwater demand (allocation)*. Retrieved July 2016, from Environmental reporting: Reporting before the Act: Fresh water: <http://www.mfe.govt.nz/more/environmental-reporting/reporting-act/fresh-water/freshwater-demand-indicator/freshwater-demand>

Ministry for the Environment. (2010b, December 01). *Allocation compared with renewable freshwater resource*. Retrieved from Ministry for the Environment: Environmental Reporting: Reporting before the Act: Fresh water:

<http://www.mfe.govt.nz/more/environmental-reporting/reporting-act/fresh-water/freshwater-demand-indicator/freshwater-dema-0>

Mitchell, C. (2016, June 20). *Millions of litres of water illegally taken: Is ECan doing enough?* Retrieved July 2016, from Stuff:

<http://www.stuff.co.nz/business/farming/81191467/Millions-of-litres-of-water-illegally-taken-Is-ECan-doing-enough>

New Zealand Treasury. (2016, June 8). *Higher Living Standards*. Retrieved July 2016, from The Treasury: About Treasury:

<http://www.treasury.govt.nz/abouttreasury/higherlivingstandards>

OECD. (2007). *OECD Environmental Performance Reviews: New Zealand*. OECD Publishing.

OECD. (2015). *Environment at a glance 2015: OECD Indicators*. Paris: OECD Publishing. doi:<http://dx.doi.org/10.1787/9789264235199-en>

Statistics New Zealand. (2015a, October 21). *Annual rainfall*. Retrieved July 2016, from New Zealand's Environmental Reporting Series: Environmental indicators Te taiao Aotearoa:

http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Atmosphere-and-climate/annual-rain.aspx

Statistics New Zealand. (2015b, October 21). *Groundwater physical stocks*. Retrieved July 2016, from New Zealand's Environmental Reporting Series: Environmental indicators Te taiao Aotearoa:

http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Fresh%20water/groundwater-physical-stocks.aspx