Every drop is precious: an efficient water

The biggest problem is the enormous losses that occur from excessive evaporation

MICHAEL JEFFERY

A world water crisis for drinking and agricultural purposes is the gravest threat facing our civilisation. This warning isn’t mine — it’s the sober, consensus view of international business leaders, expressed through the World Economic Forum this year.

The forum cautioned that water crises easily could deteriorate into famines, failed states, wars, disease pandemics, refugee floods and bigger climate impacts. It was underscored by a UN report predicting that by 2030 world water demand might outrun supply by as much as 40 per cent. These are focal issues for Australia to consider urgently as we look to our future physical security and plan how to improve our own water management as a key component of maintaining a healthy landscape.

Every Australian knows we live in a dry continent, subject to droughts and flooding rains, a land where every single drop should be deemed precious and managed accordingly.

So what do experts say happens to every 100 drops of rain to fall on our continent?

- Two end up in dams and water storages.
- Two are lost as city run-off.
- Ten end up in our rivers.
- Thirty-six soak into the soil.
- Fifty drops are evaporated into the atmosphere, including from run-off, largely because they can’t filtrate a carbon-deficient, compacted soil.

And what do we control and redistribute? You’re right; the 14 per cent we can see. We largely ignore the other 86 per cent.

Thus, our big problem is not so much a lack of rain or even its distribution, it’s the enormous losses that occur from excessive evaporation, losses that will only increase as temperatures rise.

Put simply, we must ensure more of the 50 drops soak into the soil to the root zone of the plants, not only to help them grow but to be transpired by these plants through their leaves back into the atmosphere, where about two-thirds of them fall again as mostly local rain.

Award-winning Slovakian hydrologist Michal Krawcz recently calls this the “small water cycle” and says that maximising coverage of our landscape (including our cities) with green will increase it; conversely, bare landscapes will un-happily reduce it.

A biodiversity of green ground cover also increases essential soil carbon, every gram of which can help facilitate the retention of up to 8g of water and vice versa.

plan may help us prevent chaos

In summary, a healthy, carbon-rich soil enhances the small water cycle, which in turn retains more water in a cooler soil, generates greater local rainfall, reduces fire intensity and, importantly, helps to create essential cloud cover.

Without getting technical, there are many ways to restore the small water cycle, including slowing the movement of water, riparian zone repair (the interface between river and land), wetland and flood plain restoration, revegetation, managed grazing and limited till and pasture cropping.

The art and science of bringing these components together as a co-ordinated whole form the basis of visionary Upper Hunter Valley grazier Peter Andrews’s “natural sequence farming” philosophy. Pleasingly, wise farmers and Landcare groups are implementing many of these measures — but unfortunately, they face the lack of a nationally co-ordinated water and evaporation management plan, something our new Water Minister, Barnaby Joyce, may care to examine.

Our cities experienced water shortages during the millennium drought, but these are nothing to the scarcities likely to come as populations swell, demand soars and accessible sources of water dwindle.

One answer is to recycle our urban water: all our storm water, our domestic waste water, even the effluent from our sewerage systems. With modern technology this can all be cleansed to a standard even higher than it was originally.

Another reason to recycle water, rather than excessively desalinate seawater, is to recapture all the nutrients that are being lost to the bottom of the oceans, so we can reuse them in food production. Earlier civilisation did this for thousands of years. There is a huge but manageable challenge for urban planners and architects along with tremendous commercial opportunities in design advanced, hygienic, low-cost systems that recapture and recycle water and nutrients.

A further way to manage our water is through the use of underground dams — also known as water banking or managed aquifer recharge — where excess water is pumped down into a convenient aquifer in the wet season, then pumped up again for agricultural use or to water a city in the dry. Presently, we inject about 50 gigalitres of water a year in trial schemes in places such as the Burdekin, Adelaide, Perth and the Namoi Valley.

Storing our water underground, where it can’t evaporate and is naturally cleansed, is a thoroughly Australian solution to a classically Australian problem. Let’s do more of it.

By storing more water in our landscapes and soils, and in aquifers beneath our farms and cities, by recycling and wise conjunctive management of all water sources, we can ensure a water-safe future in a world becoming less water-secure by the day. The knowledge embodied in this “blue revolution” will become one of our greatest exports — potentially worth billions — as well as our humanitarian contribution to nations facing acute water scarcity.

This, in turn, will help lessen the risks of conflicts, famines, state failures, refugee floods and pandemics that may imperil our own security in future. Water and its proper management could be Australia’s special contribution to a safer, more sustainable world.

Michael Jeffery is the national soils advocate. He is a former army deputy chief of staff, state governor and governor-general.
Tanks for the memories, but

EXCLUSIVE

SHANE RODGERS
QUEENSLAND EDITOR

Once upon a time, in a land of warm, sunny days and balmy, sticky nights, people built their lives around water. Lots of it. Bursting from every tap, hose and faucet in an endless rhythmic fountain across a million suburban backyards.

There were sprinklers flailing gallons of water over impossibly green lawns and giggling children running under misty sprays.

Sunday afternoon was a ritual of soaked-up sedans being bathed like giant metallic dogs and a shower wasn’t something you “took” — it was an experience to be savoured. Slowly.

Then something happened.

Almost overnight, southeast Queenslanders woke in a collective cold sweat with a realisation that Brisbane and its surrounds might actually run out of water. Most of the dams were barely muddy puddles, there had been no rain for years and governments and councils were forced to fast-track severe water restrictions, water recycling, desalination and public warning campaigns.

Households were delivered four-minute shower timers, more than 200,000 government-funded water tanks were installed and any house that dared use a sprinkler was subjected to vitriolic public scorn.

And so it was a generation of indulgent water addiction ended abruptly. Cold turkey.

Belinda Glinde
dem and daughters Ava, left, and Grace

LYNDON MICHIELEN

water-saving habits are the new normal

DROPPING DEMAND

Average Southeast Queensland residential consumption

Litres per day

300

250

200

150

100

50

2001 03 05 07 09 11 13 15*

* To August 15

The facade of endless water was over. That was 10 years ago.

Most restrictions are now lifted and SEQ dams are almost full, yet indulgent water habits have not returned.

The numbers tell the story.

Figures supplied to The Australian by SEQ Water show that in 2002 the average SEQ resident used 292 litres of water a day.

At the height of the water hysteria in 2007-08, daily consumption dropped to about 140 litres. So far this year, it is 156 litres a day; since 2007, the annualised average has not been above 169 and there has only been one week with usage back over 200.

Similar dramatic results have been seen in Melbourne since water restrictions were introduced in 2006.

The curious miracle of the changed water behaviour has attracted attention from all over the world. In fact, according to SEQ Water, the region holds the record in developed countries for the lowest recorded average daily usage week at 124 litres.

There are various explanations.

Tanks have taken over a lot of outdoor water usage that previously came from town water and water bills are now separated and visible.

SEQ water communications manager Mike Foster says most of the change comes down to people retaining water-friendly habits.

“The drought certainly seems to have changed the way people think about water and the way they use it,” he said. “We just haven’t seen the bounce back. While the tanks have played a part, the feedback from our retailers is it is more the behaviour.”

The changes are also having an impact on infrastructure outlooks.

Forward water projections have been revised down, suggesting SEQ can get by until beyond 2030 without a new, major dam.

Belinda Glinde
dem, of suburban Mount Cotton, typifies the changed behaviour and has realised that drought-induced water conservation behaviour of SEQ adults is just normal for their children.

“For my kids, playing under the hose is a real novelty, but for my brother and I it was quite standard when we were kids,” Ms Glinde
dem, the director of Belle PR, said.

“We learnt those behaviours in drought time and now they are ingrained. I find the lawn isn’t as important to me as previously.”