



Under the proposal, irrigators would have to submit a statement that tallies with aerial images of their water use. AAP Image/Cubbie Group

'Tax returns for water': satellite-audited statements can save the Murray-Darling

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If the allegations of water theft reported last week by the ABC's Four Corners are accurate, they reveal a fundamental failing in the integrity of the system that records water use in the Murray-Darling Basin.

We have a suggestion that could help to restore trust that water users are not abusing the rights granted by their water entitlements and jeopardising the Murray-Darling Basin Plan by taking more than their fair share.

Instead of the current system in which state governments monitor consumption via water meters, we suggest that water users should instead have to fill in an annual "water return" – akin to tax returns – to account for their water use, which could be efficiently verified using technology such as satellite imagery.

Read more: Is the Murray-Darling Basin Plan broken?

6/25/24, 12:44 PM 'Tax returns for water satellite audited statements can save the Murray-Darling Basin' These water returns could be randomly audited using satellite imaging and other spatial data, to reveal the (hopefully few) cases in which actual water use does not appear to be consistent with the user's declaration. This would highlight places where more water than reported has been used – for instance, where the amount of crop grown is inconsistent with declared water use, or where the amount of water in storage exceeds what the returns indicate. Once these disparities come to light, they could then be investigated.

Time-series observations could also provide a dynamic, ongoing assessment of the credibility of water use declarations, helping to reveal over time the properties and regions with unusual patterns of water use.

An advanced approach might use blockchain reporting systems to improve the integrity and transparency of the data, ensuring that the water licence holder, the state-based regulator, the Murray-Darling Basin Authority and the spatial data manager (perhaps the Bureau of Meteorology) are all accessing the same data in the same time frame. This could help to overcome the current ambiguity about who is responsible for the integrity of implementation of the Basin Plan, which has been exposed by the responses to the ABC report.

Integrity and trust

A viable water market depends on integrity. If people lose confidence in the system, they are more likely to cheat. This in turn erodes public confidence that licence-holders can be trusted to hold private water extraction rights of an important resource that remains publicly owned and managed (within a system that bestows private rights to extract and use water).

This requires a system of oversight that can minimise the risk of water fraud or theft. Confidence in the current system is not likely to be reinstated by reviews and inquiries. Trust will only be restored when individual water users are genuinely accountable for their actions.

Regulating water use across the vast Murray-Darling Basin is hard. There are tens of thousands of irrigators, holding many kinds of water licences, collecting water in all sorts of ways: from surface flows, groundwater, river extraction, and flood plain harvesting.

Irrigators can buy, lease or borrow water. Under the existing water market, the right to extract water can be flexible in time and location. There are questions about the capacity of public agencies, including the Murray-Darling Basin Authority, to supervise such a complex system effectively, given limited manpower and funds and the high costs of supervision under cumbersome metering and compliance arrangements.

Under the Water Act 2007 and the Murray-Darling Basin Plan, water extractions are legally restricted to a “sustainable diversion limit”. But determining and enforcing this limit, which can vary according to water availability, requires reliable data and accountability.

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The distrust between Murray-Darling Basin states has been made worse by a lack of transparency. States have signed up to the National Water Initiative but it is proving difficult to ensure that all water users are complying with tighter arrangements for controlling water allocations.

Our suggested system of annual water-use declarations, verified using satellite data, would provide this transparency because it could work at a range of scales, from individual farms right up to the entire Murray-Darling Basin.

Licence-holders, public agencies and communities all need reliable information. The evidence of what a licence-holder claims to have extracted needs to be unambiguous and verifiable, preferably using random audits that are fast and inexpensive. The system needs to be designed so that fraud can be detected and controlled efficiently.

How it would work

Similar to a tax return or statutory declaration, the user would be legally responsible for the accuracy of their annual water statement. Random audits comparing declarations with information from telemetry and satellite imagery would provide the integrity checks.

Satellite imagery can pick up detailed information on areas watered and crop types, as well as channel flows and storage levels, which could verify the information provided in an annual water return. Where the licence holder uses methods that limit this oversight (for example, piped flows and covered storage), they would be required to install other technology to enable random audit. Water users who use more observable traditional methods would not have to incur this cost, as this would not be needed.

The great majority of irrigators with whom we have worked are careful and responsible about their water use, with an abiding concern for river health and sustainable water management. No one, including us, wants to burden responsible farmers with extra red tape. An annual declaration for someone who already meters and records their water use should not be an onerous task.

The oversight costs should be reduced by the use of technology. The Bureau of Meteorology already has a role in the Basin Plan, and has expertise in satellite data. Geoscience Australia has already trialled satellite-based vegetation analysis with the Murray-Darling Basin Vegetation Monitoring Project. Many of the elements of what is needed are already available.

We need a system that reinstates trust in the integrity of water resource management. Ambitious policies and large-scale plans often fail or lead to counterproductive consequences because of the “devil in the detail”. Designing elegant, cost-effective regulation is a 21st-century challenge that can be met using a combination of old tools (legally binding declarations) and new technologies (satellite audits).

The alternative is an ongoing breakdown in trust, and with it the health of the Murray-Darling river system itself.

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