

SALINITY - our silent DISASTER

by [Justin Murphy](#)

Australia is facing an environmental problem that could, and very likely will, bring our economy to its knees, if we continue to ignore it the way we have in the past. We have known about it since 1924, but only since the 1970s have we seriously tried to understand it and combat it. Now it's accelerating, and we may have already lost the battle.



Although Australian native trees are used to high salt conditions, they cannot survive when salt is brought near the surface by rising water tables.

Dryland salinity, the gradual loss of farm and grazing land to rising salt, is a massive problem, hard to comprehend and harder still to stop. There is salt everywhere in Australia; vast amounts of it, mostly located underground. It has built up over many thousands of years, originating from the weathering of rock minerals or the simple act of sea salt dropping via rain or wind.

The native Australian vegetation evolved to be salt-tolerant. Many of the woodland species, for example, have deep roots and a high demand for water. Whilst the system was in balance, the salt stayed put. But when European farming arrived and replaced the natives with crop and pasture plants that have shorter roots and need less water, the inevitable happened. With every fall of rain, unused water "leaks" down to the water table, raising it, and bringing the salt up with it. That process continues today, and the volumes of water and salt are vast.

Under the soils of the Western Australian wheatbelt and some parts of eastern Australia the salt store is so immense, and the movement of sub-surface water so slow, that restoration to fertility of salt-affected land will take generations. Some areas may never recover. According to the CSIRO, even if we replant up to 80% of the native vegetation, some cleared catchments would not see recovery within normal human timescales.

It is a tragic irony that the felling of many billions of trees to make room for the farming that let this nation prosper has caused, in just 150 years, our worst environmental crisis, and destroyed a natural balance that had existed for millenia.

Now farmers are frightened as they watch their farms degrade, billions of dollars

are being lost, and scientists are admitting for the first time that there are no practical answers yet. It's little wonder, because the problems go well beyond agriculture. Dryland salinity also causes serious damage downstream from where the clearing has happened. Aquatic ecosystems are suffering, as is biodiversity and even urban infrastructure as saline groundwater rises in country towns and attacks foundations, roads and bridges.



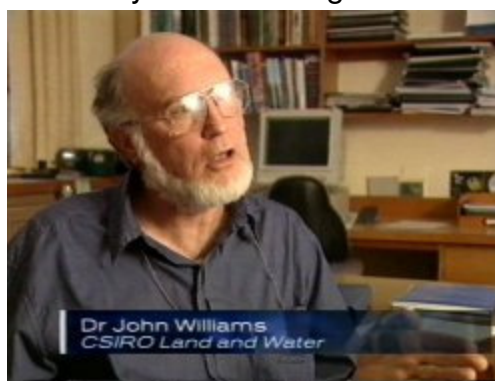
(left) There are very few plants that can grow on salt-affected land, and the quality of pastures are reduced enormously by rising salination. (right) Salt areas often form flat pans, such as on the right of this fence. When rain falls on these areas, salt is carried downhill into streams and dams.



It is now time for the decision-makers to respond. Politicians, bureaucrats, rural industry groups and the financial institutions that fuel the entire rural sector must face the facts.

[Dr John Williams](#), Deputy chief of the [CSIRO Division of Land and Water](#), is one of several senior scientists who have recently spoken frankly about the urgent need for action.

"What has changed is that we have recognised that the seriousness of the problem, and the need for radical land use change, is not being understood clearly at the level of policy. We cannot fiddle at the edges. We must face radical land use change, because we don't have farming systems that can control salinity and at the same time generate sufficient income for social and community well-being in the rural sector."



That is an unpalatable admission - a message the scientists wish they did not have to deliver. But the truth is that many of our agricultural systems are unsustainable. They "leak" not only water but also nutrients, and we don't yet know how to design new systems that will capture the water and nutrients in the way that natural Australian ecosystems does. Native vegetation could do it, imported European

systems mostly can't.

And it's not only the CSIRO that is voicing concern. Dryland salinity affects every Australian state, with many state agricultural agencies consequently involved in a nation-wide land management effort of daunting proportions.

The figures speak for themselves. So far, about 2.5 million hectares of land is affected and, given what we can see is happening, this could increase to 15 million hectares. What is more, the land that is effected is much of our most productive agricultural land. One estimate puts the capital value of lost land at almost \$700 million so far. Lost agricultural production is \$130 million a year and increasing.

The cost of damage to infrastructure is currently \$100 million a year. Some 80 country towns across Australia are in trouble. For example, the NSW town of Wagga Wagga needs to annually find \$500,000 to deal with the corrosion and degradation of roads, footpaths, parks, sewage pipes and housing by saline seepage. And parts of Western Sydney, in the South Creek catchment, are finding this once rural problem has finally come even to the biggest of cities.

In Western Australia, the picture is little short of tragic. The CSIRO's [Dr Tom Hatton](#) points out, with language once reserved for Brazilian rainforests, that the western wheatbelt is losing an area equal to one football oval an hour.



"Eighty per cent of the remnant native vegetation on farms and fifty per cent on public lands is at risk. The South West of WA is one of the great biodiversity centres on the planet, it is particularly well endowed with plants and animals. Many of those species are restricted naturally to places in the landscape which we will lose to salt. Most of the river beds and banks are degraded, and over half our usable river water is already saline, brackish or

marginal.

"For me it is tragic, and I'm saddened by our inability as scientists to get the message across."



As excess salinity expands rapidly in Queensland and Tasmania, and with sites also being reported in the Northern Territory, it is possibly South Australia that presents the most worrying picture. Testing at a site on the Murray, just south of the point where Adelaide's water is diverted, has revealed a trend that troubles Professor Peter Cullen, a member of the [Prime Minister's Science, Engineering and Innovation Council](#), and Director of the [CRC for Freshwater Ecology](#).

"The projections on the Murray are quite scary. Over the next 20 to 30 years, at current levels, salinity will increase to the stage where it will be outside World

Health Organisation recommended drinking levels for much of the year. That's serious for Adelaide."

Dr Tom Hatton is also unequivocal on the matter of South Australia, "I am most worried about Adelaide. The projections over the next 30 years are serious ... here's a whole State whose water supply is under threat."

Over the past century, at least 15 billion trees have been cleared from the Murray-Darling Basin alone, with the same number felled in Western Australia. Add in the other states, and the total is astronomical. How reckless it seems then that land-clearing goes on today at the rate of probably 300,000 hectares a year. Queensland leads the way, but New South Wales is also hard at it.

And those who clear won't necessarily be the ones who suffer. The sad truth is that cause and effect are separated by distance and time. As Andrew Wooldridge from the NSW government group Salt Action points out, "the actions and decisions taken by one individual affect others who may be physically close or at a large distance. Generally, the mistakes made in the uplands are visited on those in the valleys."



(left) Lower lying areas of pasture are often the first to be affected by rising salinity levels. Monitoring of standing water (right) is finding that many sources of drinking water in rural areas are becoming increasingly contaminated by salt as well.



But are they necessarily mistakes when most farmers are only following established practice? Who was to know that cereal cropping with lupins on the WA sand-plain country is "leaky" and inefficient, until the CSIRO and WA government made detailed measurements? And yet that one experiment tends to sum it all up.

Beneath the root zone of the lupins, almost 70 kilograms of nitrogen were lost for each hectare. The nutrient simply drained away, along with 200 millimetres of water. But in the adjacent, undisturbed banksia woodland, there was no loss of either.

It underlines the fact that, at this stage of our understanding, there is no real option other than replanting the missing trees. Agroforestry will need to dominate in the



wetter regions, and full-scale forestry will have to become a major land use elsewhere. "Industrial Strength" land-care is what the scientists are calling for, with all the enormous social implications that will follow. The structure of rural communities will change (as if they haven't already), and the economics of regional Australia will have to shift radically. The traditional family farm may disappear, with people being paid to stop cropping and start the long-term investment of tree-planting. But how the banks and large Agribusiness firms will respond is uncertain.



Regenerating land like this will be expensive, difficult and very slow.

What is certain is the need for urgent action, more research, and political will at every level to take hard decisions that may often prove unpopular. Why? Because worse news is at hand. Before the end of 1999, the Murray-Darling Commission is due to release details of regional audits and surveys they have been conducting for several months. It is strongly rumoured that the results are bad, and some river-condition predictions are very bad - even for rivers thought originally to be a no great risk.

The rumours lend weight to the words of Dr Tom Hatton, uttered five months ago.

"I would say without question this is the largest environmental crisis we face, and if people don't believe me now, they soon will."



Further Information:

Justin Murphy's [story for the 7.30 Report](#) on salinity, broadcast on 13/05/99.

The [National Dryland Salinity Program](#) - lots of national, state and project-based information

The [Murray-Darling Basin Commission](#) (MDBC)

Western Australia Agriculture [Catchment Hydrology Group](#)

Dryland Salinity Infosheet: [Urban Salinity in Wagga Wagga](#)

From the Slab: [Why don't Trees Count in Economics?](#)

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