
Introduction

In 1989, CSIRO published my report, ‘Regreening Australia: The environmental, economic and social benefits of reforestation’. The report was a preliminary investigation into a large national program to ‘regreen Australia’ through massive reforestation and revegetation over a period of 10 to 20 years.

The 1980s were a time of growing interest in land degradation and the role of reforestation in addressing the problem. In the same year, the National Farmers’ Federation and the Australian Conservation Foundation joined forces to propose a national land management program involving, as a central element, the establishment of 1,300 Landcare groups. Another initiative that year was the Western Australian Government’s launch of Tree Trust, the largest reforestation program to be undertaken in Australia.

The main justification for the CSIRO proposal was to combat land degradation, regarded then as Australia’s most serious environmental problem. However, the report outlined other potential benefits, including mitigating and adapting to climate change; protecting biodiversity; increasing the sustainability and productivity of Australian agriculture; boosting timber resources; building environmental management expertise and innovation; creating many useful jobs; and boosting national morale.

The proposal attracted a great deal of public, political and professional interest. A science and environment journalist described the report as seminal, saying it had persuaded a lot of people, including him, to take the notion of such massive reforestation seriously. A parliamentary committee inquiry into land degradation recommended its adoption, and it influenced government policy. However, the proposal was never implemented on the scale envisaged and necessary to realise the potential benefits.

In 2012, the Board of Australia21 agreed to re-examine the topic, using the 1989 report as a benchmark or reference point, given: almost 25 years had passed; greater recognition of the seriousness and urgency of climate change; and heightened global economic instability, making job generation potentially important to maintaining economic and social stability.

Australia21 conducted an expert roundtable at the University of Melbourne on 21 February 2013, attended by 27 farmers, foresters, researchers, business people, former government officials and others (and with input from several more invitees who could not attend). The central question discussed was, ‘What are the benefits of large-scale reforestation and revegetation, and how can they best be achieved?’.

The roundtable was run under the Chatham House Rule to encourage frank and open discussion: people would be quoted, but they would not be identified by name or affiliation (although in some cases they have been cited by name with their permission). The discussion was recorded and transcribed. The transcript forms the basis of this report (together with other sources, including email exchanges with participants). Participants were given the opportunity to comment on a draft of the report and, in some cases, to edit quotes.

The intention is to provide a broad overview of a complex topic from different perspectives. The process has obvious limitations: it cannot delve into detail; important issues can be brushed over or left out; what is said is often a matter of opinion, sometimes contested and reflecting special interests and other sources of bias. The report does not purport to be a consensus, although there was a high degree of agreement on most of the key points. Responsibility for the content rests with the author and Australia21.

What is being done and is it enough?

There was a broad acknowledgement of the important policy developments, increased investment, improved scientific understanding and substantial practical achievements in environmental restoration and regeneration over the past 10–30 years. It was suggested that the major policy settings for what needs to be done are now in place (*see appendix*).

Policy flaws have been recognised and addressed over recent years in reviews of major conservation policy frameworks and the introduction of new policies relating to climate change. The national networks of Landcare groups and regional natural resource management organisations, established in the 1990s and 2000s, have contributed to better landscape management by farmers and other landholders.

However, it was also acknowledged that, despite all these gains, Australia's natural environments were continuing to degrade and decline, and more work was needed (*see story on landscape condition*). The gap was widening between the magnitude of challenges like climate change and land degradation and the scale of our responses.

‘We mustn't lose sight of the fact that we've spent something like \$10 billion of public funds over the last decade in a lot of these types of activities.... We need to be starting from the base of things having happened out there, but what we're now saying is perhaps not enough or not quickly enough, or there is whole set of new challenges coming on board, so we need to position ourselves to respond to those based on our experience of what we've learned’.

‘We've had three decades of having a go at this and there has been a lot of work and there is a basis of these incredible networks of people and lots of experience. How do we turn that into the next few decades, and it really is a large, long, national project.’

‘My sense is that the policy problem has been the same policy problem for a long time, and that is that the scale of responses that governments and others apply isn't at the right level for the scale of the problem. So there's a real mismatch between scales of responses and scales of impact or issues... We have to fix the place. It's falling apart around us.’

‘[We] talked about a comprehensive policy framework being in place, at least at the national level, but it's symptomatic to me of the situation happening in developing countries where we've got what we call policy inflation and capacity collapse.... We're writing better policy but, on the other hand, we're losing the ability to actually implement those policies.’

The scale of the gap between challenges and responses was clear from the results of a poll of participants before the roundtable, which drew 18 responses. The seriousness of Australia's environmental problems rated an average 8.2 on a scale of 0 to 10; the adequacy of what Australia is doing to solve them was given an average rating of 4 out of 10. Four more specific questions about the effectiveness of Australia's environmental programs, how much we'd learned from past revegetation programs, what remained to be learned, and the compatibility of priorities across local, regional and national scales, all received low average scores of between 3.9 and 4.6 on the same scale.

The condition of Australian landscapes

The 1989 CSIRO report noted that since 1972 there had been 16 inquiries calling for the development of a national land use policy - on average about one a year. A 1986 Parliamentary inquiry stated that ‘the seriousness of the land degradation problem facing Australia is so great that it is difficult to comprehend but there should be no doubt that if the trend is not reversed it could have serious consequences for the economy and the environment’.

In 1988, the then environment minister, Graham Richardson, acknowledged the problem but said he could do little about it. It was a sleeper, not sexy enough, politically impossible to sell; there were no votes in it.

How far have we come in more than 20 years? The Australian Government’s State of the Environment 2011 report says the situation and outlook for Australia’s land environment are mixed. Although we have made progress in many aspects of managing landscapes, the trends for many indicators of land environmental values remain adverse, and are likely to be exacerbated by climate change.

Although vegetation and soils are in relatively good condition across large areas of Australia, this is not the case in much of the intensive land-use zone where agricultural production is concentrated, nor in some parts of the rangelands. The rate of land clearing, one of the most significant pressures on the land environment, averaged around one million hectares per year in 2000–2010. By the end of the decade, however, the continental extent of land clearing was balanced by the extent of regrowth—although the two forms of vegetation are often different.

The impacts of other landscape-scale pressures—principally invasive species, and inappropriate fire and grazing regimes—are increasing in many areas. In agricultural systems, the loss of soil carbon, and soil acidification and erosion, are problematic and may have major impacts on production.

Livestock grazing is the most extensive of Australia’s land uses, practised across 55% of the continent. The conservation and Indigenous estates have continued to expand; each now represents more than 20% of Australia’s land area. The effectiveness of management has improved for most land uses, particularly for those that are most intensive, but needs to improve further in many land-use systems to protect and sustain their environmental values. The expansion of human settlements and new forms of mining are having locally significant impacts in those regions where they are concentrated.

Some governance and institutional arrangements for the land environment have changed substantially, but remain suboptimal in a number of important respects. Levels of investment in management of the land environment, in research and development, and in knowledge and information systems that enable good land management are significant but still inadequate.

Climate change is expected to have profound effects on the land environment, particularly on native vegetation and production systems. Some native vegetation communities are likely to disappear, others will change substantially in extent and composition, and novel ecosystems will arise. Impacts on production systems are likely to be mixed, but generally adverse.

What are the benefits – and risks?

Many benefits - and some risks - of large-scale landscape revegetation and regeneration emerged from the roundtable discussion. Most were linked across scales and sectors: local, regional, and national; environmental, economic and social. They were not discussed in depth or detail; most were covered in the 1989 CSIRO report. As one participant noted, 'We wouldn't be here if we hadn't spent 30 years knowing why it's needed and what the benefits might be'. Much of the discussion blurred distinctions between the 'why' and the 'how'; some issues are developed in the next section on the 'how' of transforming landscape management.

'...our society as a whole has disconnected from nature and we're suffering from it.'

Benefits:

The overlapping and inter-related benefits of large-scale landscape regeneration, reforestation and revegetation, include: preserving biodiversity; reducing soil and water loss and degradation; providing shelter from the wind, shade from the sun and fodder for animals; a cooler regional climate; carbon sequestration; increasing soil fertility and productivity; more sustainable agriculture; more timber and other tree products; better pollination of crops; production of biofuels; enhanced security of food, water and energy supplies; benefits to tourism; supporting rural communities; creating large numbers of jobs; bridging the cultural divide between city and country; encouraging national reconciliation; greater wellbeing from reconnecting with nature; and improved national spirit and motivation (*see stories on Yan Yan Gurt Creek catchment and aviation biofuel*).

'It's multiple things that are going to motivate people to participate in and support this activity in the future, and that's regenerating for resilience, regenerating for water quality, regenerating for biodiversity conservation, for profit, for beauty, for community and social capital, for health and happiness.'

'The social and cultural aspects are an important part of it. It's the reconnection with nature. I think our society as a whole has disconnected from nature and we're suffering from it... where you don't really know where your food comes from or... whether that food or that landscape is in good condition or a sustainable condition.'

The Yan Yan Gurt Creek story

'I wanted to reflect on my involvement as a farmer in a catchment revegetation project over 20 years. It's the Yan Yan Gurt Creek catchment in the south of Victoria. The motivation for us as a farming family was that our farming landscape was degenerating: there were issues with the salinity, water logging, erosion, lack of biodiversity, paddocks being too big, minimal shade and shelter, and lack of ecological balance.

Landcare back in the early 90s was going full steam ahead. There were others in the community that were thinking likewise as a result of the Landcare discussion and networking that had been happening. So the first thing that was done was to get a photo mosaic of the catchment and everyone would then look at their farm on the landscape mosaic and it generated tremendous discussion and interest because we really hadn't seen this sort of thing before.

And then from there strategies were derived and restoration started to occur, identifying the issues, and the solutions, which were common across the landscape. So that over a 20-year period revegetation in this catchment went from 6% to 21%. But it was very much on farmers' and landholders' terms. They were placing trees on landscapes for reasons that mattered to them, and that was really important.

People who had lived in that landscape for many years before and hadn't been there for maybe 10 or 15 years, have been inspired by the significant landscape changes. They talk about the way the landscape has been transformed and isn't this great. There's been a lot of very positive feedback.

We've been involved in family tree-planting projects for 20 years. Each year we have from 20 to 40 people coming from the city - cousins, other relations and their friends - who have become involved in the process, people who have very little exposure to agriculture. They just enjoy the experience of coming out and sharing the whole program of revegetating the landscape.

One of the reactions that sticks in my mind is the young girls, who were probably about 20 odd at the time. They came down to help plant some trees on a salt affected area, and then two years later they returned for our annual tree planting time, and the trees had really grown quite well. When we went down there and showed them the trees they planted, they actually started dancing around the trees. They thought it was fantastic.

The real connection between city and country is food security. You can see this landscape is actually a place which can produce secure food which can be sustainable. I think our society has this innate perspective about what a good landscape looks like. I notice people - city-based people - can look at this landscape and say, this looks right to me. So that's one of the real motivating things to me: to tap into this innate perspective that people have. When they see a good landscape, they want to be involved in that sort of development.'

Andrew Stewart

Aviation biofuel

'I am involved in a project that is looking at the potential benefits of biofuel for the aviation industry. It is one of several international projects assessing different supply chains for sourcing and processing biomass into renewable aviation fuel, to achieve agreed targets for reduction in greenhouse gas emissions. To certify new fuels from these sources, the industry must do a rigorous sustainability assessment, including a lifecycle assessment for greenhouse emissions and land-use change.

This project is assessing the environmental, social and economic sustainability of farm-grown mallee biomass converted by fast pyrolysis to fuel products, including jet fuel. While it is a work in progress, there's good evidence there are environmental benefits on farms. Mallees' ability to intercept and use greater amounts of water in cleared landscapes can be a strategic part of catchment management programs to address the "altered hydrology" threat to conservation values, due to dryland salinity or permanent inundation. In terms of biodiversity, mallees can provide additional habitat resources and refuges for small mammals, birds and reptiles, particularly when adjacent to native vegetation.

The over-riding social concern with biofuels globally is their threat to local food security through diversion or displacement of food crops. Although mallees are not a food crop and the recommended planting design takes up only 6% of a farm paddock, they do compete with adjacent crops and pastures for moisture 10–20 metres from the tree belts. This opportunity cost has been taken into account. Mallees integrated into the mixed- enterprise farm will have no discernible impact on grain output and minimal impact on meat output. A social benefit is regional employment resulting from location of processing plants in these regional locations, and the accompanying demand for other technical services.

Then there is the economic question: is the whole operation viable? This case study for the south-west of Western Australia shows that the benefit to the farmer can be greater profit than current livestock enterprises, risk mitigation through diversification from crop income and, potentially, carbon-farming income. If some predictions prove accurate, renewable jet fuel might provide, say, 5% of total jet fuel consumed in Australia by 2020 and this would require about 300,000 hectares of mallee plantings in precincts around regionally located processing plants. In targeted supply precincts, this scale of landscape change can profitably augment larger, effective environmental programs.'

Kevin Goss

One participant noted the different motivations of those who own the rural lands where most of the change and transformation would occur (agriculture covers about 60% of Australia) and the vast majority of the population. For individual farmers, the issue was about the long-term viability of a business and the stewardship of the land. For the wider community, the message needed to be that it was all about security relating to food, fire, water and energy. Both the sustainability of supply and the amelioration of hazard provided by healthy, resilient landscapes benefit all Australians, not just those living and working in them.

Risks:

Participants also raised the risks, obstacles and limitations associated with large-scale landscape reforestation and revegetation. These include: opposition from sections of the community who don't want it; economic pressures to adopt a more commercial mode of production; an increasingly diverse mix of ownership and management patterns; constraints and pressures from other types of land-use change (such as coal seam gas mining and urban spread); declining rural populations; the increased regulatory oversight associated with forests compared to agriculture; and, finally, the huge risks - and uncertainties - posed by climate change, now and in the future.

Several participants commented that landscapes were contested, and large-scale landscape regeneration could be seen as obstacles to development, or as taking land out of production, or harming communities. Landscapes protected in national parks or conservation covenants were seen as obstacles to mining. 'Wall-to-wall' plantations of the sort established by Managed Investment Schemes could alienate and antagonise local farmers and communities (*see story on MIS plantations*).

'There are large segments of the Australian society that would say that large-scale reforestation and revegetation is not desirable. These segments are actually quite powerful at the moment.'

'We're underplaying the fact that there's a lot of contested landscapes in Australia at the regional scale... the contested values are often dealt with through planning systems, which I think are mostly incompetent planning systems.'

Climate change:

Climate change is a 'game changer' in landscape management. Participants noted its importance to why we need to do more revegetation, how we do it - and even if we can do it. The role of landscapes in carbon sequestration will be vital, both in mitigating climate change and in providing incentives to regenerate landscapes for other reasons (*see stories on soil carbon and the Carbon Farming Initiative*). Revegetation also has other, regional climate-change effects, including lowering temperatures, and changing wind speeds and rainfall patterns.

'We're looking at what is the potential [of large-scale revegetation] to mitigate mean climate and extreme climates, and what is the feasibility of doing that. We know that vegetation cools the landscape in summer, probably by up to two, maybe three, degrees. But the rainfall is a bit more uncertain.'

Three key features of climate impacts on biodiversity to which we need to respond are: large change, uncertainty, and spatial variation in impacts. The main messages concern the need for more habitat, diverse habitat, and landscape-scale efforts; all bear on how we change landscape management.

‘It is completely inconceivable that we are not going to be facing substantial change, massive change, potentially complete change from one type of ecosystem to another.... Ecologically, no-one has any idea how that will actually play out because it’s outside our experience. It’s something very hard to imagine, but all the evidence points to a large change happening. Whether that involves a lot of loss in biodiversity we don’t know - or just change. So our mission, if we can’t stop the change, is to try to stop the loss.’

‘There are a lot of assumptions here that we’re going to be able to restore vegetation and keep it in the landscape. I’m pretty pessimistic that we’re going to be able to do that in 30 to 50 years’ time, with changes in climate, more drought and bushfires.’

‘In thinking about climate change, I asked a German PhD student of mine: if you consider walking through a future forest, maybe in a hundred years’ time, with projected 5 or 6 degree temperature increases, what would you see? She said that she would expect to see younger forests, driven by a more aggressive natural disturbance regime and tree death or regeneration failure, and unusual species mixes and compositions, as ecosystems adapted to the changing climate. I asked her what her biggest concern would be, and she said that would be regeneration failure and longer periods of exposed soil, leading to landscape carbon losses which would accelerate climate change and thus more carbon losses.’

Climate change also means removing regulations that restrict revegetation to local species (with some definitions limiting it to species that occur naturally within 20 kms), or seek to return the landscape to what existed before the arrival of Europeans. This is not to deny the importance of protecting local native plants and animals, but to press for a broader effort that reaches beyond this goal. Bush corridors will be important to encouraging the natural migration of species into new landscapes.

‘The ecosystems we have in the future are going to be very different from the past. ... So we need to hold that term of ‘novel ecosystems’ as part of our agenda setting.’

‘Any discussion has to, explicitly, take climate change into account because we know it is happening and habitats and environments and ecosystems that we now see will not be the same in 10 or 15 or 50 or 100 years’ time. We have to forget about trying to preserve patterns and compositions and communities and groups of species as they are now, or how we think they were 50 or 100 years ago.’

Community attitudes:

Just as climate change makes landscape health and resilience both more important and more difficult, so too does cultural change make these goals more important and difficult. The roundtable discussion emphasised not just the biophysical benefits of landscape transformation, but also the psychosocial benefits: to national morale, to community spirit and to personal health and wellbeing. Participants also acknowledged activity on the necessary scale would only be achieved if the wider community, including people in the city, became involved at some level or another.

And yet the evidence suggests this will be harder than ever because the public seems to be becoming less concerned about climate change, less interested in environmental issues, and more disengaged from public affairs and national concerns more broadly. In 1989, ‘regreening Australia’ was proposed as a way of inspiring a disillusioned population deeply concerned about society’s direction.

Since then, the passion and intensity seem to have gone out of the debate about where Australia is heading. People have become more detached from the broader agenda in order to focus on achieving a measure of satisfaction in their own lives. Constantly presented with images of the world as a glass half empty, they are more determined to see their own lives as a glass half full.

‘It presents us with a challenge to come up with a new vision for Australia that will re-engage these people, get them to look beyond their own personal domains and jobs. But it also means it’s going to be very difficult to get that community involvement that so many of us here were talking about as being an essential element of expanding the activities that we’re doing in this area.’

How can the benefits be best achieved?

The discussion of how to transform landscape management took a perhaps surprising turn. There was relatively little time spent on the policy settings, which were generally seen to be in place, and public funding, which was already substantial through these policies. There was some debate about institutional structures and private investment opportunities. However, much of the discussion focused on the intangibles of language and vision and the importance of increasing public interest and community action.

...achieving many of the specific changes and reforms requires a new way of seeing Australian landscapes.

A new vision, focus and language:

There was a wide recognition that achieving many of the specific changes and reforms required a new 'vision', 'narrative', 'paradigm' or 'national business case': a new way of seeing Australian landscapes that would encourage the scale of intervention needed to address the problems.

'We've got, at best, green shoots of what the vision should be, but in terms of implementing that in institutions that determine what we do, from the international, national, state and regional level, it's not there. We need to work on that.'

'I'd see success as the creation of some sort of vision for almost 8 million square kilometres of healthy ecosystems in Australia, be that native ecosystems or pasture and cropland, or city park and backyard, or road verges.'

'There's a lot of government money on the line.... it's appropriate that we try to get an integrated view, a vision, of what we'd like to see.'

Central to the new approach is a shift away from a conservation ethic focused on threatened species and nature reserves and reflected in notions of 'regreening' (used in the title of the 1989 report and in the current proposal's provisional title) - and towards a recognition of multiple functions and values, and a focus on healthy, resilient ecosystems and the many valuable services they provide, environmental, economic and social.

This approach has already been incorporated to some extent into policy documents, but there was wide agreement that it needed to be extended much more widely among landholders and the general community. Participants mentioned the potential roles of the mass

and social media, the education system and the arts in achieving this new understanding.

Participants noted that ‘the old conservation narrative’ associated with ‘locking up’ land often did not connect very well with landholders. The new narrative needed a new language.

‘We ought to change the name from ‘regreening’; it’s got the wrong connotation. Just talking about planting trees and revegetation gives the wrong meaning of what we’re trying to achieve. We’ve got to integrate what we’re trying to do with agriculture, with grazing, with farming.’

‘In terms of the terminology - regreening Australia, reforestation... we’ve got to look at what sort of language we use. That sort of language just frightens farmers.... We’ve got to think about how we can get good language in there which is going to excite and stimulate landholders to participate, so they’re inspired to be part of the project.’

‘Talk about large-scale reforestation would be probably the single most disenfranchising message we could try and sell.... while there are some real positives in terms of wood resources, the legacy there is that reforestation has this sense of wall-to-wall forest and displacement of all the communities.’

More than more trees:

Landscape management is about more than fixing degraded landscapes, or planting trees or other woody vegetation. It is about all landscapes, the whole landscape, and other interventions including allowing natural regrowth and managing impacts from invasive species and other threats.

‘It isn’t just about that part of the property that might be planted with woody vegetation [such as trees], it’s about all the vegetation on that property. We’re really trying to get transition and transformation of the whole landscape.’

A participant noted that China had reforested large areas of land. A recent study found that while a lot of the new forests were doing well, a lot were gone: the trees had died because it was too arid. However, they had become shrubland. ‘Those shrublands have persisted without human intervention, so it’s sustainable and it’s resilient and it’s basically free.’

Several participants argued in favour of paying more attention to restoring depleted levels of organic carbon in soil through increased photosynthesis, with multiple benefits to soil fertility, water availability, biodiversity and climate change (*see soil carbon story*).

‘Rather than just thinking we have to revegetate, reforest, why don’t we make the current level of vegetation work better in a photosynthetic system for longer in the cycle, and that will give us benefits as well.’

Similarly, the role of litter and humus is an important part of landscape regeneration.

‘In the work that I’ve been doing, the litter layer is actually one of the most crucial aspects of the functioning landscape. It holds the run-off back and pulls the sediment out of the run-off better than anything else. It also invigorates the soil biology, which turns over soil and improves the soil fertility. Obviously it also has a carbon store, and so carbon eventually works its way back into the soil.’

The importance of soil carbon

Outcomes Australia, a not-for-profit organisation that aims to find and implement proven solutions to Australia's problems, is championing the importance of restoring carbon to soils, amongst other improvement to agricultural land management. Its 'Soils For Life' program seeks to improve how the Australian landscape is managed through: increasing the efficiency of water use, improving soil health, revegetation, and increased biodiversity. The program is identifying leading practice in landscape management, and encouraging its adoption across Australian agriculture.

Outcomes Australia and its supporters have proposed a 'Net Emissions Reduction Incentive' (NERI) to facilitate the reduction of carbon dioxide in the atmosphere through the restoration of soil carbon reserves. NERI would provide a clear signal of future carbon price rises to increase innovation and investments in verified carbon offsets that reduce emissions liability.

The Commonwealth Government's Carbon Farming Initiative (CFI) does not currently cover soil carbon sequestration (*see CFI story*). Other features of the CFI, such as the value of carbon credits, caps on credit and the required 'permanency' provisions of the carbon storage, also work against its use in encouraging carbon capture in soil. However, this role of soil-carbon restoration in mitigating climate change is contentious. Some researchers question the cost and feasible rate of carbon capture, and so its importance in offsetting carbon emissions.

'I would point us very strongly to Outcomes Australia's "Soils For Life" program, because what they're doing is demonstrating how to regenerate the land by showcasing a whole range of innovative farming systems right across the Australian landscape, in different sorts of landscapes, climates and agriculture. Part of it is planting trees on the ridges and the valleys and the marginal land. Much more, it is regenerating healthy soil to increase food production - healthier food production.'

There is massive increase in soil biodiversity and carbon content, water-holding capacity and climate-change resilience. So I implore us to integrate our vision and our action plan with agriculture, with innovative, biological-systems-based agriculture. It will provide a way to engage the whole community, because it's healthier food, healthier farmers, healthier animals, and worms back in the paddocks. Most Australian farms have no worms in the paddocks: they've been killed off by the synthetic chemical agronomy, by the fungicides and the pesticides.

If we really integrate this, we will get the greening, the revegetation, the regeneration of the whole landscape, and we won't have the big floods and the run-offs and we won't lose the top soils to dust storms and to sheeting rain.'

John White

A landscape management industry:

There was considerable discussion - and agreement - on the need for a landscape regeneration 'industry' that would produce the necessary capacity to implement policy, increase professionalism, and provide technical services, education and extension.

'Success in this whole exercise would be if the 'revegetation industry' achieves the same status in Australia as the mining industry. You can count this as a number of things but it's a cultural shift in that revegetation and sustainable land management are seen as part of our identity, what we do, both for rural people and city people. It also needs to be seen as an economic activity based on sustained, long-term investment through public-private partnerships. In the same way that realising economic benefits from mining depends on public investment in infrastructure, training and skills and private capital in resource extraction, large-scale revegetation and land repair will require public investment in green infrastructure and private investment in a range of benefits.'

'If it's the case that government is going to step up with large amounts of money for large-scale work, then there is a bunch of structural problems in the system. Indeed, the revegetation industry doesn't really exist. It's a bunch of sheltered workshops and cottage industries around the place.'

'We really need to develop a whole level of professionalism.... if you take the mining industry analogy, we need the revegetation services business to be there, with all that technical expertise, just like we would expect from other sectors, rather than it being seen as a job for volunteers.'

'Success would be if the revegetation industry achieves the same status in Australia as the mining industry.'

A landscape ‘industry’ could provide jobs almost anywhere in Australia, so making an important contribution to social and economic stability in the event of global economic troubles. This job creation would support rural communities and help the unemployed in urban areas. The 1989 CSIRO report noted ‘regreening Australia’ could be an important component of guaranteeing people an adequate income in return for doing socially useful work. The report stimulated programs such as the current Green Corps, which give young people work experience and skills.

More investment:

Part of the new vision is the opportunities for greater private-sector investment in environmental regeneration created by pricing carbon and water and the availability of ‘patient’ capital in superannuation funds. The new Carbon Farming Initiative was seen as having great promise, but also needing development to widen its application (*see CFI story*). For indigenous people, the money available through mining royalties could be invested in landscapes. Several participants mentioned extending the GST on food and dedicating this revenue to landscape management, both as way to increase funding and to make consumers more aware of where their food comes from, and its quality and sustainability, which was seen as a critical development.

‘The market’s got a really interesting and very important part to play in the future of revegetation in Australia. Success would be finding the balance between all the players.’

While there was general acceptance of the value of new economic incentives such as carbon credits, some cautioned against expecting too much of such convergences and relying too heavily on these to achieve environmental objectives. The story of Managed Investment Schemes plantations held lessons for landscape development (*see MIS story*). Society should pay for - or regulate - environmental outcomes that were socially desirable and beneficial. Linking carbon sequestration to biodiversity goals could be confusing and counterproductive.

‘Trying to bring services together when they don’t naturally fit or pretending that you’re going to get environmental outcomes that society wants paid for by productivity increases, then we’re missing the story. We’re selling a false story because if society wants environmental outcomes, society should pay for them.’

The Carbon Farming Initiative

The Government's Carbon Farming Initiative (CFI), introduced in 2011, is seen as an important initiative in integrating markets to deliver natural-resource-management outcomes. It allows farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land. These credits can then be sold to people and businesses wishing to offset their emissions. The CFI also helps the environment by encouraging sustainable farming and providing a source of funding for landscape-restoration projects.

The CFI has broad political support, rigour and potential international recognition. It is a work in progress, with a process in place for broadening its reach once difficult technical and policy issues are sorted out, and provided new applications are feasible, do not create perverse incentives and continue to meet primary policy goals cost-efficiently. However, in its current form, the CFI has limitations and risks, including poorly targeted delivery of landscape projects - for example, monoculture plantings with limited biodiversity value.

'I don't think in its current form, using the existing methodologies, the CFI is going to achieve a lot of significant landscape-scale projects. But it's fantastic that the government is developing a mechanism which can influence the landscape in a really positive way, and with some tweaking and using the CFI instrument in a different way, we could see a lot of private investment.

We've talked a lot about volunteerism and the fact that we don't have an environmental industry or a revegetation industry. I think if we really engaged well with environmental markets as a way of driving this landscape change, we would see the type of thinking that would really precipitate an industry that would do things both cost-effectively and successfully, or as successfully as possible.

I believe that to make the CFI more effective, the Government could recognise that sometimes revegetation takes decades to establish, but in high-value biodiversity areas such as strategic national corridors, it is worth investing in. The CFI should deliver a methodology allowing carbon credits to be forward sold in priority areas - so landholders get paid to establish their vegetation, rather than having to wait until the trees mature. Landowners who own land in these priority revegetation areas could then make the investment based on a profitable return through the upfront sale of carbon credits. Climate change is a multi-decadal problem, so innovative solutions which sequester carbon over the long term, and deliver permanent biodiversity outcomes concurrently, are worth pursuing.

The global carbon market has seen an investment of several hundred billion dollars a year in solving a particular problem - climate change. Market mechanisms have proved their effectiveness in mobilising action and delivering outcomes. We can take that same approach and the government can use instruments that can realise the changes we're wanting to see in the landscape. The CFI is an available tool that could be used to kick that off.'

Paul Dettmann

Managed Investment Scheme plantations

In 1989, the Western Australian Government launched what it described as the largest reforestation program ever undertaken in Australia: 'Tree Trust', a project aimed at planting 105 million trees on 105,000 hectares of cleared farmland in the State's south-west by 2000. The project was to rely totally on private investment, generating revenue from pulpwood, creating jobs, and providing environmental benefits such as reducing salinity, waterlogging, erosion and pesticide residues, and absorbing carbon dioxide.

Tree Trust marked the beginning of a rapid expansion of timber plantations on farmland. Some areas were planted through direct investment by Japanese and Korean companies as a resource for their pulp and paper plants. However, the bulk of new plantings were established by companies set up to take advantage of taxation arrangements aimed at stimulating investment in longer-return agricultural industries.

This growth was also related to the readjustment of Australia's forestry away from native to plantation sources through State and Commonwealth policies, notably 'Plantations for Australia: the 2020 Vision' (1997), which aimed to treble Australia's plantation forest area. With substantial technical assistance from government agencies, Managed Investment Schemes (MIS) generated an investment of about \$3 billion, mainly from small-scale individual investors, in plantations of Tasmanian bluegum and other fast-growing eucalypts. Altogether, almost one million hectares of plantations were established over 10 to 15 years.

What happened? There are important lessons to be learned. The ventures showed that, given incentives, large areas can be rapidly reforested. On the other hand, they also revealed the risks if incentives distort priorities. Virtually all of the original companies involved went into receivership; most of the plantation resources were bought by pension funds. The projects became dependent on a particular set of financial conditions that existed

prior to the global financial crisis (GFC). By putting money into MIS, investors could reduce tax liabilities, or transfer them to the future when they were receiving lower income in retirement. When credit dried up after the GFC, the business model was no longer viable.

Because of the legal requirements placed on the schemes, the companies had to plant the same year as they got the money or soon after, so they had to acquire large areas of land and plant quickly, and often used less suitable sites. Also the companies generally did not actively engage with local farmers or the community. While farmers who were nearing retirement benefited from getting a good price for their property and plantation companies brought more employment to regional towns and cities, those in smaller rural communities felt a sense of loss as neighbours left, houses were demolished and their grazing lands replaced with trees. In some regions these plantations were considered to reduce ground and surface water yields, whereas elsewhere water quality has recovered in previously salinized catchments.

There were other consequences. The national 2020 Vision to increase plantation areas from one to three million hectares was focused on providing increased resources to industry, particularly for the softwood sector, because investment by governments in new softwood plantations had stopped in the 1980s. However, most investors wanted returns over a period of about 10 to 15 years, not the 30 years needed to grow softwood. So, while a major goal had been to establish new softwood plantations for domestic consumption, the result was a lot of eucalypt chipwood for export markets.

The trees are still there as an asset in most cases, although many plantations are not growing as fast as initially projected. The bigger problem now is that the Australian dollar is high, there are alternative sources coming onto the global market, and pulpwood prices have dropped. So there are many challenges in getting the returns originally promised and it is quite likely in some areas that plantations will revert to farmland.

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Collaborative governance:

A new vision is critical to improving the effectiveness of local Landcare groups and the 54 regional natural resource management bodies (or catchment management authorities, as they are called in some states) by creating more collaborative governance. This would embrace greater and more stable funding; better integration of the national perspective with regional and local perspectives; and devolving decision-making from federal and state governments to allow decisions to be made by those who own, manage and work the land, to give farmers and rural communities more ‘buy-in’ and incentive.

‘If you look at the process, the basic plan, it was flawed because of its failure to involve people early on. A colleague of mine said... we used to do policy with people, now we do it to people.’

‘To my mind all actions are local: no matter how big your project is, someone has to walk into the paddock or along a river bank with a bucket or something and do the work.’

‘The priorities of private landholders and their local communities don’t accord with the priorities of governments at Federal levels. One of the measures of success in this forum would be recognition of the importance of working with landholders at a local landscape level to develop shared priorities for natural resource management investment in revegetation and management of existing vegetation.’

Participants had mixed views about Landcare groups and regional natural resource management bodies. Some defended them, others were more critical. Performance was patchy: while some groups worked well, others lacked the capacity, science and leadership to achieve what was needed. There needed to be better integration with a national vision; a more collaborative approach was seen as a way to lift effectiveness.

‘I have some nervousness about pushing the local engagement angle too hard. As a past chair of a CMA (Catchment Management Authority), a local Landcare group president and a current large-scale farmer... I have numerous examples of gross wastage of limited resources where such an approach was used. In short, lots of squeaky wheels are greased and big picture issues are lost in the “feel good” outcomes... The urgency of the problem we face requires vision and leadership on a grand scale with champions across the political divide.’

‘It’s true that, in the opinion of some, these groups are less effective now than they once were, but others argue equally persuasively they have matured from a low base and are now much more effective. The 2012 Caring for our Country review highlights the patchy nature of progress among the regional bodies and their very different starting capacities. Overall, the review concludes (relative) capacity and capability have improved.’

Part of the challenge of achieving the necessary scale was about recognising the ‘limits of acceptable change’ and the need for a ‘social licence’ from the wider community.

‘We’ve got a whole bunch of factors driving the environment, some of which we can control, some which we really can’t control and we have to adapt to. The limits of acceptable change are essentially normative and contested, so we’re not going to easily resolve them. We have to work our way through the things we think are really important.’

‘If we’re going to be talking large scale, a paradigm of looking after ecosystems by restoring them, replacing them, or maintaining them, we need to have the social licence at the community level across scales for that kind of transformation.’

Science and measurement:

Another element of the vision is to provide better integration, not just between scales and between policy and action, but also between policy, action and science, including in the area of baseline measurement and monitoring, and risk management.

‘Are we as good at the revegetation business as we think we are? I would say we’re not. There is much more knowledge and research and information that need to be gained and gleaned.’

‘It’s more about being far more astute in understanding treatment and response relationships that sit behind these environmental programs because, up until now, there’s been no way of measuring the effectiveness or even efficiency of the effort.’

Measurement mechanisms and risk management plans needed to be in place from the outset. This means that at any time during the process, it is possible to tell whether what is being done is successful or not, and that when risks factors like climate change arise, there is a strategy to respond to it.

Resilience thinking:

At the broader, conceptual level, the language of resilience should be part of the new narrative. It links socio-economic and environmental systems; it includes notions like thresholds, tipping points and boundaries of acceptable change; and it clarifies the question of scale, of linking large-scale intervention to local action.

‘Resilience thinking brings you back to ecosystem services and multifunctionality and making sure that the systems can service a whole bunch of society’s needs.... Resilience thinking says the system is important, there’s lots of redundancy in it, we don’t have to chase the conservation of every single species for it to keep working.’

Next steps:

Possible next steps to spread the message about the importance of landscapes, going beyond the roundtable and this report, included: mass and social media campaigns; inclusion in the education curriculum; a national conference, like the landmark ‘Focus on Farm Trees’ conference held in 1980; building a new, influential alliance like that between the National Farmers’ Federation and the Australian Conservation Foundation that led to the Landcare movement; and establishing a bureau or centre for landscape transformation by bringing together several rural universities to do both research and promotion.

Conclusion

...we are depleting our natural heritage and betraying future generations.

A central theme of the roundtable was Australia's failure to close the gap between the magnitude of the challenges in landscape management and the scale of its responses. As a result, we are depleting our natural heritage and betraying future generations. It is an indictment of our society as a whole, and governments in particular, over many decades.

Repairing Australian landscapes and preparing them for global change, with respect to both potential benefits and impacts, requires: involving all Australians; acknowledging climate change as a 'game changer'; moving beyond a narrow, conservation agenda; building an 'industry' to provide the necessary capacity, professionalism and expertise; stimulating more private investment through instruments such as carbon and water pricing; better integration of planning, design and implementation across national, regional and local scales, including greater devolution of governance to the local level; stronger linkages between policy, science and action; and enhancing the capacity of existing structures such as the Landcare groups and regional natural resource management organisations.

The reasons for the lack of progress are not, now, primarily to do with poor policy or lack of public funding, and the remedies do not, therefore, lend themselves to specific recommendations. The reasons include cultural features such as the divide between urban and rural Australians and our growing disconnection from nature and all it provides for us (except in recreation). The threat

to our landscapes concerns urban parks and suburban gardens as well as our farmlands and national parks. It poses a challenge for all Australians, including urban populations, not just those who 'work the land'.

Public concern about the environment, including climate change, has receded in recent years. According to one regular poll series, the top concerns are healthcare, cost of living, crime, the economy, immigration and education. These issues are not necessarily the most important: they are the topics that dominate public and political debate, the ones that politicians and media commentators keep talking about. All Australians - and especially our political leaders - should be having a lot more to say about the health and resilience of our landscapes and ecosystems. This cultural resonance and reinforcement is particularly important if community organisations such as Landcare groups and the regional natural resource management bodies are to flourish.

However, the explanation also goes beyond cultural questions and political priorities. The widening gulf between what we are doing and what we know we need to do is also true of other major issues facing the country. All relate to a failure, not just of political vision or will, but of political philosophy: an inability to see and accept that focusing too narrowly on economic growth and material prosperity and opportunity is creating growing social and environmental costs that jeopardise our future as a nation. If environmental and social goals are always seen as secondary and subsidiary to economic priorities, we will never 'fix the place'. This is another reason why this is a challenge for all Australians.

A new vision and language of landscape management is now being reflected in policy, but few outside the sector would know this. Without a new narrative or vision to give policy a broader, compatible philosophical rationale and cultural context, we will always come up against the failure to translate policy, however well formulated and well intentioned, into effective capacity to deliver the results we seek. That was the case 25 years ago; it remains true today.

Conversely, however, what we have achieved in the last 20 to 30 years of landscape management provides the foundation for a bigger and bolder endeavour to protect and regenerate our unique environments. In doing that, it could become a symbol of a broader transformation of Australia into a genuinely sustainable society - environmentally, socially and economically. In inspiring this vision, the benefits would be incalculable.

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