

1. Executive summary

Healthy soils are central to delivering resilience to climate change and natural disasters, meeting our emission reduction targets, growing our agriculture industry, and securing human health, food and water security, biodiversity and economic growth.

The National Soil Strategy (the Strategy) is a 20-year strategy that sets out how Australia will value, manage and improve its soil. The Strategy has been developed in collaboration with state and territory governments, the National Soils Advocate and other major stakeholders in soil science and land management.

The goals and objectives in the Strategy are aimed at restoring and protecting soil nationally, by driving collaborative and coordinated on-ground action, research, education, monitoring and governance. All levels of government, industry, research institutions, private soil science practitioners and land managers have a role to play in caring for our soil resources.

The Strategy outlines 3 key goals: prioritise soil health, empower soil innovation and stewards, and strengthen soil knowledge and capability.

By June 2022, the Australian Government will work with the states and territories to develop and release a National Soil Strategy Action Plan. The Action Plan will detail specific actions (programs and activities) required to achieve the vision, goals and objectives of the Strategy. These actions will meet the SMART principles — that is, Specific, Measurable, Achievable, Relevant and Time-bound.

Prior to the release of the Action Plan in June 2022, the Australian Government will implement soil-related measures which contribute to the objectives of the Strategy under a Commonwealth Interim Action Plan.

4. The National Soil Strategy

This Strategy provides a national vision and shared goals and objectives between the Australian, state and territory governments for managing soil across all landscapes.

The goals and objectives in the Strategy are aimed at restoring and protecting soil nationally, by driving collaborative and coordinated on-ground action, research, education, monitoring and governance (Figure 1). The Strategy recognises that all levels of government, industry, research institutions, private soil science practitioners and land managers have a role to play in caring for our soil resources.

This 20-year Strategy sets the direction for innovative sustainable soil science and land management nationally, while still allowing for a regional and local focus given that every soil management issue is unique.

The Strategy will ensure that soil health is appropriately prioritised and considered in government decision-making processes. It will give those who manage our soil, in government and non-government organisations, the knowledge, tools, networks and capabilities that will empower them to ensure that soil is preserved while sustaining and increasing productivity. By strengthening soil knowledge and capability, the Strategy will ensure that research is conducted in a coordinated fashion and the results are shared with those who need them.

The Strategy forms part of current Australian Government priorities including Delivering Ag2030 and National Agricultural Innovation Agendas and builds on current investments related to soil such as the Australian Government's National Landcare Program, Agriculture Stewardship Program, Emissions Reduction Fund, Technology Investment Roadmap, Future Drought Fund and Reef 2050 Plan (2018). The Strategy will develop a national approach to soil monitoring so that we can gain a better understanding of soil condition and trends across the country. The information that is gathered will help land managers, policymakers, regulators, land use planners, the private sector and non-government organisations to understand how soil condition changes over time. This information, along with research, innovation, development, extension, communication and adoption of new practices, will be used to prioritise investments and actions to restore the country's soil function and to show how land management practices can be improved to prevent future degradation.

The time for a National Soil Strategy is now. Governments, industry and many others are increasingly recognising the importance of soil to the country's economic, social, cultural and environmental future: more questions are being asked, gaps are being identified and new interventions are being developed.

The Strategy is supported by a Commonwealth Interim Action Plan, which will be followed and replaced by a National Soil Strategy Action Plan. More information on this is provided in Section 7.

6. Goals and objectives

Guiding principles

This strategy contains 3 goals and 12 objectives which will guide Australia's efforts to better manage its soil. The goals and objectives are underpinned by the following principles:

- **Collaboration:** Collaborative decision-making, alignment of effort and partnerships contribute to effective research, policymaking and implementation.
- **Science and innovation:** Delivery of world-leading research, innovation, monitoring and evaluation.
- **Traditional Knowledge:** The culture, values, knowledge, innovations and practices shared by First Nations Peoples are valued and respected and should inform, where appropriate, planning, management and conservation of our soil resource.
- **Knowledge sharing:** Sharing knowledge, contributing to evidence-based and cost-effective decisions and actions.
- **Future soil security:** Sustainable use of our soil must meet the needs of today without compromising the needs of future generations.
- **Immediate action:** Immediate action is required to better manage, prevent or remediate degradation of soil and the environment where there are threats of serious or irreversible environmental damage.
- **Prioritise and integrate:** Accounting for soil in all relevant decision-making significantly enhances outcomes in terms of agricultural production and ecosystem services.
- **Tenure-blind:** The impact of soil degradation processes and soil management does not abide by legal tenure boundaries and therefore management responses must also transcend ownership and boundaries.
- **Practical, place-based knowledge and adaptation:** Enabling bioregional and local knowledge to be used in the development of place-based and locally adapted and generated solutions.

Goal 1: Prioritise soil health

Soil plays a fundamental role in the carbon (energy) cycle, nutrient cycle and the water cycle, as well as being the engine room of food production, an archive of human and natural history, and host to extraordinary biodiversity. Soil underpins all terrestrial life.

Australia will struggle to improve soil health, manage its water supply, improve the resilience and profitability of its farming systems or meet its emissions reduction objectives without a renewed focus on, and re-energising of, efforts to improve soil management.

All Australians including industry, the private sector, land managers and governments at federal, state, territory and local levels have a role to play in properly managing our soil.

Objective 1a: Recognise the value of soil

We recognise the value of soil by making sustainable soil management a critical consideration in policy development, research and practice change across other national priorities. This objective not only aims to raise the profile of soil and the importance of soil biodiversity to maintain soil health and support terrestrial living systems. It also increases the likelihood that landscape-scale degradation will be appropriately addressed, as the cause may often start with the soil and its management.

As part of work to improve recognition of the value of soil, the federal, state and territory governments are working to quantify the value of all services provided by soil. Environmental-economic accounting, which quantifies the interactions between the environment (including soil) and the economy, is an effective way of recognising value.

Progress measures

- 1) Services provided by soil are recognised, understood, measured, mapped and valued within environmental, socio-cultural and economic accounting frameworks.
- 2) Soil and the impact of an action or activity on soil is recognised as a critical consideration for relevant government portfolios, policy and programs.

Objective 1b: Strengthen leadership and partnerships to address national soil priorities

We must strengthen national leadership, partnerships, coordination and collaboration at all levels and scales in soil activities across Australia — for example, by leveraging and connecting to existing work, building and fostering relationships and networks, and providing an integrated information platform to better support soil management decisions and actions. Collaboration between the private and public sectors across regions, industries and disciplines will be critical to the success of the Strategy.

Progress measures

- 1) Engagement across multiple jurisdictions, portfolios, industries, sectors and First Nations Peoples on soil-related matters is improved.
- 2) Leadership and partnerships that increase cooperation and co-investment for joint soil programs across governments, industry, the private sector, First Nations Peoples and others are improved.
- 3) National, regional and local coordination of soil activities is improved to increase leverage from past and present investments.

Objective 1c: Advocate the importance of soil

Not all Australians (including the public, government agencies, industry and the private sector) have a good understanding or appreciation of soil. Many see it as ‘just dirt’.

There is a strong and obvious link between soil and agriculture. However, many are unaware of or overlook soil’s critical linkages and the benefits it provides to the environment, infrastructure and human health.

The Australian Government recognises the value of soil and acknowledges the need to embed an appreciation of this value across relevant portfolios and services. It established a National Soils Advocate for this reason. The role of the National Soils Advocate is to be an independent voice for the importance of good soil management and health and to advocate to ministers, industry and senior executives across governments and the private sector. This is a great foundation. However, to build a better understanding of the value of soil, more is needed across all levels of government, industry, the private sector and society in general.

If governments, industry and the private sector have a greater appreciation of the value of sustainable soil management, they are more likely to increase their commitment to conserving and improving soil health.

Progress measures

- 1) An independent, influential and effective voice for soil health is continued by maintaining government support for a National Soils Advocate.
- 2) Governments, industry, the private sector, First Nations Peoples and others have an increased knowledge and awareness of the importance of soil to Australia's environmental, socio-cultural and economic wellbeing.

Objective 1d: Improve Australia's international leadership in soil knowledge, awareness and management

Australia is well placed to contribute our expertise in soil science and management to a range of international fora where soil policy, research and outreach activities are shared between nations and contribute to global soil security efforts — for example, the Global Soil Partnership, the International Union of Soil Sciences and several UN conventions.

Australia is a signatory to many international conventions, and under these has mandatory reporting obligations on our contribution towards global outcomes (for example, the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity). The Strategy reaffirms Australia's commitment to soil research and management and will provide the mechanism to better report and promote our efforts to a global audience.

The Strategy also provides the opportunity to support industry sustainability frameworks and encourages the use of sustainably grown Australian food and ingredients into local and international supply chains.

Progress measures

- 1) Australia effectively contributes to significant international fora to progress efforts to improve soil health.
- 2) Australian soil policy, research, standards and other relevant information, skills and capabilities are shared with other countries, demonstrating leadership and commitment internationally.
- 3) National soil data and information is publicly available in a format that supports Australia's international reporting obligations under international conventions.

Goal 2: Empower soil innovation and stewards

Soil is complex and has varying capabilities across Australian landscapes. Therefore, our management practices must be flexible and tailored to support productivity and reduce soil degradation in all landscapes.

The future of the Australian agriculture and food sector is highly dependent on its ability to remain productive and competitive while protecting the resources it relies on, given fierce competition.

Agricultural research and adoption of innovation are primary drivers of productivity growth. Various economic analyses and reviews undertaken over the past 30 years show that investments in agricultural research and innovation have been profitable for Australian producers, with Mullen (2007) reporting rates of return of between 15% and 40%.

Despite governments, industry, the private sector and other stakeholders providing significant funding to improving soil health over the years, soil continues to degrade, impacting Australia's economy, environment and society. To address this, governments need to plan for and create opportunities for innovation and partnerships in soil management so that land managers are empowered to understand and manage their soil.

Objective 2a: Promote soil stewardship

Soil supports our vegetation, provides habitat to many animals and is critical to our land, air and water. To support the environment and business bottom lines, it makes sense to provide mechanisms to support organisations, individuals and land managers, at all levels and scales, to more effectively manage our soil.

There are a range of ongoing land management practices that are particularly important for maintaining soil and soil health, enhancing soil ecosystem services, and maximising resource use efficiency — for example, maintaining year-round vegetation and ground cover, increasing areas of rehabilitated and replanted native vegetation, maintaining or improving soil structure, minimising soil disturbance, minimising acidification in low-pH soil, reducing soil contamination, and encouraging soil organic carbon and biota. Additionally, there can be a need to manage soil constraints by strategic, infrequent or 'one-off' practices that ameliorate limitations.

For example, liming to increase soil pH and methods to address non-wetting surfaces, or peak sub-surface compaction. Collectively these practices underpin thriving ecosystems and enhance agricultural productivity.

Progress measures

- 1) The factors that motivate land managers to adopt better soil and landscape management practices are better understood and applied to program design.
- 2) Initiatives that support land managers to adopt best-practice soil and landscape management practices are in place.
- 3) Best-practice soil management is better promoted within and across industry boundaries.

- 4) Soil information and tools are available to support land managers in the development and adoption of locally appropriate management practices.
- 5) First Nations Peoples are engaged and employed in the planning, management and implementation of soil initiatives.

Objective 2b: Optimise soil productivity, sustainability and resilience

The Australian agriculture sector has set a goal to increase agriculture farm gate output to over \$100 billion per year by 2030 and has identified improved soil management as critical in reaching this target. If we are to continue to expand our exports and meet emerging global food security needs, our soil must be sustainably managed to ensure it is a resilient resource that supports long-term production.

Optimising soil sustainability and resilience is important in assisting land managers to recover from natural disasters such as storms, bushfires and floods. Improved soil condition also increases soil's resilience to climate change and associated natural disasters, including droughts, through improved capture and retention of rainfall.

Progress measures

- 1) Land managers are supported to make better soil management decisions through effective extension and knowledge management tools and services.
- 2) Areas are identified where changes to soil management could significantly and sustainably increase agricultural productivity, environmental outcomes and the health and resilience of soil.
- 3) Innovative soil management, science and technologies that enable sustainable productivity growth are supported.
- 4) Trade and marketing opportunities for food, fibre, forestry and soil technologies are improved by demonstrating the use of sustainable soil management practice.

Objective 2c: Help protect and enhance Australia's environment through effective soil management

To ensure that soil can continue to provide environmental services such as buffering against climate variability and recovery from natural disasters, it is important that soil health and resilience be maintained and improved.

Degradation of soil *in situ* can cause significant productivity impacts; however, it can also affect surrounding environments and human populations. For example:

- Soil contaminants such as chemicals, antibiotics and waste from urban, farming, industrial and mining activities can affect land *in situ* or be carried into waterways and groundwater supplies, impacting aquatic ecosystems, wetlands and human health.
- Clearing of native vegetation, lack of ground cover (including from fire) and tillage of agricultural lands exposes soil to water and wind erosion with significant onsite and offsite impacts, including:
 - Wind erosion

- » Onsite impacts include land degradation, nutrient loss and topsoil loss.
- » Offsite it causes air pollution, health concerns and unwanted deposits on infrastructure and agricultural lands.
- Water erosion
 - » Onsite impacts include gully and sheet erosion, and loss of topsoil and associated nutrients.
 - » Offsite water erosion contributes significant sediment and nutrient loads into waterways, resulting in significant decline of water quality.
- Urban development, earthworks (for example, for irrigation), sand mining and erosion can disturb acid sulfate soil, allowing sulphuric acid and other toxic chemicals to enter nearby waterways, causing fish kills and destroying natural ecosystems.

Progress measures

- 1) An accurate assessment of the costs of soil degradation on the environment has been made.
- 2) Land managers understand and mitigate the risks of their land management practices on the broader environment and community.
- 3) A baseline of strategic soil assets (including 'at risk' soils) is identified, valued in land use planning frameworks and policy and utilised in decision making processes.

Objective 2d: Increase and maintain soil organic carbon

Organic carbon is a vital part of soil matrix and the global carbon cycle. It comprises living and decaying biological material and residual charcoal. The amount of soil organic carbon is largely determined by rainfall, temperature, soil texture and structure, soil chemistry and other soil and biological processes.

Increasing soil organic carbon generally improves plant growing conditions. From a climate perspective, carbon incorporated into soil organic carbon can be drawn from the atmosphere and sequestered into the soil. This assists global efforts to limit the magnitude of climate change.

To quantify soil organic carbon stocks and to better link soil carbon contents to management practices, it will be important to extend our knowledge of carbon stocks and flows in Australian soil.

It can be challenging to achieve increases in soil organic carbon. A number of incentives and initiatives are required to encourage land managers to adopt practices that are likely to improve soil health and may increase soil organic carbon.

Improved knowledge

Given the complexity of soil ecosystems it is unsurprising that, compared with the large amounts of information available on above-ground plant and atmospheric performance and condition, knowledge about the physical and biological soil–plant interface is still preliminary.

To better support individual and national-scale decision-making, we need to have a greater understanding, in both fundamental and applied science, of how different management practices

impact soil organic carbon levels across different soil types, production systems, land uses, landscapes and climates.

Purchase of Australian Carbon Credit Units and the Emissions Reduction Fund

The Commonwealth will continue to incentivise land management practices that increase soil carbon, including through the world's largest government-led carbon offsets scheme.

Develop more cost-effective ways to measure, estimate and model soil organic carbon content

Further work is needed to develop techniques to cost-effectively and reliably measure, estimate and model soil organic carbon. This will enable us to verify the link between sustainable land management practices, soil organic carbon storage and flux and future productivity, economic and environmental sustainability. This will facilitate financial incentives for better soil health, such as improved land valuation and reduced borrowing risk for investments in sustainable agricultural productivity.

Progress measures

- 1) Improved management of soil organic carbon is achieved through improved understanding of the mechanistic processes, the carbon storage potential of soil, its current status, and threshold levels of soil carbon loss at which irreversible impacts occur.
- 2) Locations with the greatest potential to increase soil organic carbon stocks through the adoption and maintenance of appropriate management practices have been identified.
- 3) There is an increased understanding of the costs and benefits of adopting different management and landscape practices attempting to increase soil organic carbon content.
- 4) Effective, aligned approaches have been developed to promote the adoption of best management practices to increase soil organic carbon.
- 5) A cost-effective way to measure, estimate and model soil organic carbon has been developed which will enable better monitoring of stocks at an appropriate scale and confidence.

Goal 3: Strengthen soil knowledge and capability

Australia is one of the world leaders in soil research. Initially our focus was on fundamental research but over time that has changed – we are now more focused on applied research for specific agricultural and environmental problems.

There are major shortcomings in national monitoring, modelling and mapping of soil characteristics and functions. For example, there are deficiencies in reliable soil condition and trend analysis, forecasting and scenario planning. This information would be beneficial to a range of stakeholders – for example, it would support governments to strategically address soil degradation in areas at greatest risk. It would also help industry to better understand the relationship between management practices and soil characteristics and their trends, enabling them to decide what practices are best for land managers.

Governments, industry, the private sector, land managers and others all undertake various monitoring, research, and innovation activities for discrete purposes. Despite this wide interest, there is no clear national perspective on a set of priority purposes for soil monitoring and no unified or agreed application of the data from a coordinated program. Therefore, there is no standardised approach to soil monitoring and evaluation at a national level and very limited capacity to assess and report on the current condition and trend of our soil resources.

We need to improve the quantity, quality, accessibility and temporal continuity of soil data and information to ensure soil research and technologies are having the desired impact through policy, program and land management practice change adoption.

Objective 3a: Increase soil knowledge for better decisions

A sustained, cooperative and strategic research effort across all levels of government and industry and within academia is required to enhance our soil knowledge.

A range of soil knowledge and management tools, systems and methodologies are currently in use by governments, industry, the private sector, land managers and others across Australia. In most cases data and information are not collected or managed in a way that allows for consolidation at a national scale to understand soil condition and trends in soil characteristics. There are opportunities to use this data and information to better target research to ensure project outcomes meet the needs of land manager, and planners.

Verified, timely and nationally consistent and comparable soil data will provide evidence that will help us to:

- monitor trends in sustainable agricultural production, resilience and profitability while maintaining and, where possible, improving soil health
- improve market access internationally for high-value, high-quality, safe and sustainable food, fibre and forestry production
- monitor triple-bottom-line financial performance metrics that could reduce risks and costs of finance to those sectors accessing it

- provide opportunities for land managers to access diversified income streams – such as the Emissions Reduction Fund
- achieve effective and integrated land use planning
- adopt better land management practices.

Progress measures

- 1) The National Soil Monitoring Program to assess the condition of Australian soil and enable a commitment to long-term data collection is established.
- 2) National standards for the generation, management and exchange of soil data and information have been developed.
- 3) There is a national understanding of baseline soil condition, targets and trends that helps inform cross-sectoral decisions at the national, regional and local levels.
- 4) Soil research that provides knowledge to improve productivity and sustainability is applied.

Objective 3b: Measure benefits of improved soil management

Tracking change in the condition of soil characteristics can effectively demonstrate the outcomes of our efforts in improved soil management. There are opportunities to streamline and coordinate existing reporting mechanisms, to design new measures of success, and to increase participation in reporting to develop a coordinated national picture of soil.

Progress measures

- 1) Nationally consistent key performance indicators and methods are used to measure and report on the impact of soil investment on soil condition and trend.
- 2) There is a better understanding of the relationship of soil condition and trend to land management practices, soil organisms and climate for different soil classes in different landscapes.

Objective 3c: Make Australian soil information and data available

Soil data and information are currently stored on many systems, in different formats and on various platforms across Australia. This often makes it difficult to find relevant and consistent data and information. Land managers, including First Nations Peoples, the private sector, and industry, also collect soil data and information but, due to privacy, commercial and cultural confidentiality concerns, they do not always make this publicly available.

Because we do not know what soil data and information is available, there has been duplication of effort, and opportunities to leverage existing work and integrate soil data and information into landscape-scale monitoring and modelling for environmental-economic accounting, integrated land use planning and other uses have been missed.

There is an opportunity to better coordinate soil data and information nationally and develop agreed rules to help manage the storage, exchange and use of data and information in the future. In doing this, consideration must be given to data privacy, ethical concerns and cultural concerns of different parties. For example, it is crucial that data sovereignty for Indigenous Australians is provided for in accordance with the UN Declaration on the Rights of Indigenous Peoples and

North Australian Indigenous Land and Sea Management Alliance and CSIRO's *Our Knowledge Our Way* Guidelines (Woodward, Hill, Harkness & Archer 2020).

It is also critical that the FAIR principles underpin such future actions – that is, making information and data more Findable, Accessible, Interoperable and Reusable. This will ensure maximum potential and impact is achieved from information and data assets.

Progress measures

- 1) Soil data and information is captured, stored, managed and made available (where appropriate) through an agreed, nationally consistent approach that recognises stakeholders' needs and the multiple scales and uses for soil information.
- 2) A coordinated national soil information framework is developed and maintained to improve accuracy, governance, accessibility and usability of soil data.

Objective 3d: Build and retain diverse soil expertise

Australia needs to ensure succession of soil professionals so that effective research, development and extension continues to support land managers to better manage their soil. More action is also needed to support this research.

It is essential to retain knowledge and expertise in soil science and soil-related fields. When compared with many other natural resource science and management fields, soil science is not necessarily recognised as providing a career path. Also, there could be increased support for soil science tertiary education and research to encourage a new era of soil scientists in Australia. Although valiant efforts have been made, soil is also largely missing from core primary and secondary school education curricula and therefore younger people may not have been exposed to basic soil science and possible soil-related career opportunities.

Australia needs to tailor soil science accreditations at a national level to address the needs of the industries that require these skills. This will include building better partnerships between these soil professionals and those developing new emerging technologies (for example, remote sensing, real-time sensors and machine learning). It is also important to recognise and consider the role of Vocational Education and Training to better facilitate individuals without tertiary accreditations to support soil science, or transition into tertiary study.

Progress measures

- 1) Prospective soil professionals show increased interest in, uptake of and greater retention of career opportunities in diverse soil-related disciplines.
- 2) Universities, TAFEs and other suitably qualified providers have tailored qualifications to attract new students, and courses are better aligned to new career opportunities and industry needs.
- 3) There is engagement with national and state curricular authorities to review the teaching of soil science in primary and secondary schools.
- 4) Programs have been developed that appropriately engage with and apply Aboriginal and Torres Strait Islander Traditional Knowledge in soil science.
- 5) Initiatives are in place to improve and support diversity in soil-related training and careers.

7. How will we get there?

The Strategy

This Strategy provides a national vision and shared goals and objectives between the Australian, state and territory governments for managing soil across all landscapes. The Strategy also provides the framework under which non-government organisations and individuals can collaboratively and cooperatively develop actions at a range of levels in a coordinated way to support the achievement of the vision and each of the Strategy’s goals and objectives. For example, when regional NRM organisations are updating their regional NRM plans (which are developed with local communities and stakeholders and delivered with partners), activities to enable the Strategy’s goals and objectives can be included in what are, essentially, the only integrated environmental management plans that are regionally based across the nation.

Figure 1 The development and governance of the National Soil Strategy and National Action Plan



The Commonwealth Interim Action Plan

Prior to the release of the National Soil Strategy Action Plan in June 2022, the Australian Government will implement soil-related measures which contribute to the objectives of this Strategy under a Commonwealth Interim Action Plan, to be released alongside the Strategy. State and territory governments may also progress with measures under their own interim Action Plans in the lead-up to the release of the National Action Plan in June 2022.

The National Action Plan

By June 2022, the National Soil Strategy Action Plan (the National Action Plan) will be developed to implement this 20-year Strategy. The National Action Plan will detail specific actions (programs and activities) required to achieve the vision, goals and objectives of the Strategy. These actions will meet the SMART principles – that is, Specific, Measurable, Achievable, Relevant and Time-bound.

The National Action Plan will replace the Commonwealth Interim Action Plan. Actions from the Interim Action Plan will be integrated into and inform the actions in the National Action Plan, alongside any new actions at a state, territory, and national level. The National Action Plan will be developed in conjunction with state and territory governments, along with relevant major stakeholders and partners such as First Nations Peoples, Soil Science Australia, soil-related CRCs, the rural RDCs, the National Soils Advocate, conservation and environment groups, major land management conservancies and various industry groups and sectors (see Figure 6). It will be underpinned by the best available science, Aboriginal and Torres Strait Islander Traditional Knowledge, and experience gained from previous soil programs. It will include specific and measurable targets to underpin the progress measures and ensure the success of the Strategy can be clearly measured, monitored and communicated.

The National Action Plan will set out 3–5 year milestones and actions. It will be subject to 5-yearly reviews to incorporate changing or emerging soil-related priorities. The National Action Plan will focus on tangible projects and programs that will deliver against the progress measures – for example, projects that will:

- increase soil advocacy and extension services
- improve soil monitoring and data sharing to support sustainable soil management
- increase investment in soil research and development
- improve communication and collaboration between researchers, landholders, industry, government, First Nations Peoples, and educators
- give greater support to land managers to change practice to improve soil health
- increase focus on education, training, accreditation and career paths for soil professionals.

The National Action Plan will complement, support and build upon existing schemes and will not duplicate current initiatives.

Governance and evaluation

The Strategy and National Action Plan are the joint responsibility of the Australian Government and state and territory governments. Development at all stages will be guided by the Australian Government and the governing group overseeing the implementation of the Strategy, which is likely to comprise the National Soils Advocate and representatives from the Australian Government and each state and territory government, in consultation with major stakeholders with an interest in soil (see Figure 6).

At the jurisdictional level, greater attention needs to be given to the establishment of multi-sector governance arrangements to provide advice to governments, industries, universities, researchers, land managers and the broader community about the importance of soil. Governance arrangements will also need to recognise and consider that the implementation of the National Action Plan will occur on land held by the Australian Government, states, First Nations Peoples and private landowners.

The National Soil Strategy and supporting National Action Plan will be reviewed every 5 years and revised to ensure changes to priorities and emerging science are reflected appropriately.