

7. Sustainable Catchments

What Does Sustainable Mean?

An activity is considered sustainable when the rate at which it uses a resource or alters a natural feature or system keeps pace with the rate at which these things regenerate, grow or are replenished.

It generally relates to use or exploitation of natural resources such as soil, water, air, minerals, energy, living things or the products and services provided by them and the ecosystems they together form e.g. forests, crops, wetlands and marine systems such as seagrasses and coral reefs.



Oyster farming, Clyde River South Coast NSW, source: OceanWatch Australia

How Did the Idea of Sustainability Come About?

The idea of being sustainable is not new and whilst it may not have been called that by indigenous peoples, these traditional societies from around the world would and some still do generally live in a sustainable way. Traditional life styles had people as an actual element of natural ecosystems and if over exploitation of a resource happened these communities suffered the ultimate cost of reduced survival. Human populations were in balance with the resources available and these communities held intimate knowledge about the other living things with which they shared the environment.

Humans have however mastered more and more technologies to manipulate and change the environment to suit them. To do things like maximise production of food crops and with machines obtain large amounts of resources. Populations have grown and most people no longer have to devote most of their time to gathering food however through many of these modern practices the environment is suffering. Today individuals living in the developed world don't have that feeling of immediate reliance on the environment around them and many are divorced from even having the understanding that we all do rely on it heavily.

Whilst many individuals and groups have long recognised the harm people were causing to the environment it wasn't until 1980 that a global response was triggered with a collaborative effort from the main global environment groups to produce a World Conservation Strategy – governments began to take notice. This was then followed by a further landmark World Summit in 1992. These initiatives provoked massive outcry that ultimately led to changed opinions by governments and major organisations.

Investigate Background to Sustainability fact sheet, food chain, food web, life cycle, nutrient cycles, water cycle, soil formation, atmospheric cycle.



Humans have changed this once natural forested landscape in order to grow feed/hay for non-native livestock, source: OceanWatch Australia

What Has Happened Since These Land Mark Global Actions?

Many actions have since flowed globally, nationally and locally that are directed towards achieving what has become termed Ecologically Sustainable Development (ESD) in Australia.

<http://www.environment.gov.au/esd/>

<http://www.fisheries-esd.com/c/home/index.cfm>

<http://www.environment.nsw.gov.au/sustainingourevironment.htm>

<http://www.planning.nsw.gov.au/settingthedirection/priorities.asp>

<http://www.planning.nsw.gov.au/settingthedirection/sustainability.asp>

<http://www.lgsa.org.au/www/html/252-esdsustainabilityla21.asp>

There is now greater emphasis than ever before being placed on better natural resource management and other activities across all sectors of the community.

This is reflected by the creation or changing of various National and State Environment and Natural Resource legislation and government department restructure. Major Natural Resource Management bodies have now also been established in all states and territories of Australia.

<http://www.nrm.gov.au/nrm/index.html>

In NSW these bodies (Catchment Management Authorities – CMA) have been charged with the task of improving natural resource management and making catchments more sustainable in all their practices.

<http://www.cma.nsw.gov.au/>

In NSW Local Government has roles, functions and responsibilities under various legislation including the Protection of the Environment Operations Act 1997 (POEO Act), Protection of the Environment Administration Act 1991 (POEA Act), Environmental Planning and Assessment Act, 1979 (EP& A Act) and the Local Government Act, 1993 (LG Act), among others and have fundamental requirements to apply ESD principles to their decision making.

It is now recognised that fundamental to all of us behaving sustainably we need to understand what that means. The NSW Government has therefore, through the NSW Council on Environmental Education, developed an Environmental Education Plan – Learning for Sustainability 2007-10. Its vision is to promote “Effective and integrated environmental education to build the capacity of the people of NSW and to be informed and active participants in moving society towards sustainability”.

<http://www.environment.gov.au/education/>

<http://www.environment.nsw.gov.au/cee/lfs.htm>

What Can People do to Make Catchments More Sustainable?

Everyone lives in a catchment. The sum total of each individuals activities (consumption, impacts and outputs) in a catchment influence the total health and sustainability of processes occurring in a catchment.

To work out what people need to do to make catchments more sustainable we need to look at:

- all the things we do as individuals in and around the home
- all the things we do at work
- all the things that happen as part of the roles and functions of organisations (government and non government) that operate in a catchment.

Then ask – how sustainable is each of these actions and what could we as individuals or organisations do to make our activities:

- less wasteful in using resources;
- less polluting or harmful to natural systems of living things, and
- more directed to using materials that are renewable rather than non-renewable where possible and change behaviours accordingly.



Heavily modified urban environment, source: OceanWatch Australia



Recycle paper and cardboard in your office, school or home, source: OceanWatch Australia

What Are the Benefits of Acting Sustainably?

If activities within a catchment are undertaken in a sustainable way then some of the following things will result.

- Substantial areas of the lands natural vegetation will remain in tact and be managed in a way that ensures that representative flora, fauna and vegetation communities are retained for the future.
- Forested areas that have been designated to provide timber will be harvested in a way that keeps pace with regrowth rates and retains natural attributes that enable elements of the biodiversity to be retained at the same time as providing timber supplies and protecting water quality.
- Forests, wetlands and aquatic systems will function effectively and sustain levels of biodiversity as well as provide other ecosystem services. Seagrasses, mangrove and saltmarsh areas will continue to function effectively as nursery areas for marine and estuary life.
- Effective riparian zones will be retained to protect stream bank features and buffer water quality impacts from disturbing landuses as well as function as connectivity habitat for wildlife.
- Agricultural activities will be undertaken using leading practice so that soils will remain productive and agricultural activities will not require excessive use of fertilisers or pesticides.
- Stock will be watered off-stream with feedlots and other intensive agriculture conducted in ways that protect natural stream flow from excessive nutrient flows.
- The extraction of water will be conducted at a level that ensures availability downstream as well as for environmental flows.
- Residential areas will be made up of participating community members who recognise the need to act locally in reducing consumption of resources such as electricity and water and seek to reduce levels of waste by recycling and reusing elements of the household waste stream including such items that can become green-waste, compostable or in other ways recyclable, stormwater will be collected and grey water reused to reduce the use of townwater supplies.
- Industrial and business activities will be operating within Environmental Management Systems (EMS) that similarly endeavour to achieve a low energy footprint, non wasteful and non excessive use of resources as well as minimised outputs of toxic materials or other wastes to landfill or the environment.
- Scheduled or polluting industries will have strategies in place that quickly lead to a reduced and minimal level of pollution entering the environment
- Water quality will be high with low turbidity, high levels of dissolved oxygen and low nutrient levels and biotic water quality indicators will also be high.
- Fishers will have a greater level of marine life to harvest provided it is harvested in a way that minimises bycatch and inadvertent damage to habitats as well as reduces the level of unintentional impact from discarded fishing gear. The fishing industry is seriously addressing sustainability issues by a variety of initiatives e.g. Marine Stewardship Council's Certification of environmentally sustainable seafood products (and fisheries) www.msc.org (see also other initiatives in the Fishing Industry fact sheet).
- Recreational users will have a healthy catchment that includes clean beaches and estuaries with little litter and clear water and high quality natural areas to explore, discover and with which to relate and appreciate.



Off-stream watering points for cattle, help keep stock from damaging riparian vegetation, eroding banks and leaving their waste in stream, source: DIPNR (now DECC)



Keeping riverside/riparian vegetation helps to stabilise riverbanks, provides shelter and shade for fish and other aquatic life and also helps to buffer water quality impacts from surrounding landuses, source: OceanWatch Australia)

What Will Happen if People Don't Become More Sustainable?

If people do not collectively become more sustainable there will be an ongoing simplification of the natural systems and a substantial loss of biodiversity. There will also be:

- a reduction in the natural ecological services provided by these systems i.e. reduced oxygen production and CO₂ removal from the atmosphere by plants;
- organically depleted and nutrient poor soils with reduced productivity from agriculture, need for greater levels of fertilisers and pesticides;
- higher level/ongoing deforestation;
- poor water quality with high turbidity, high nutrient levels, higher incidence of algal blooms;
- reduction in water availability such that some users will miss out and environmental flows may cease;
- increased levels of toxins in the environment that will interfere with natural systems as well as human health; and
- unsightly beaches and estuaries heavily littered with gross pollutants.

The over all end result being an unhealthy, unattractive and undesirable catchments within which to live, work and/or recreate.

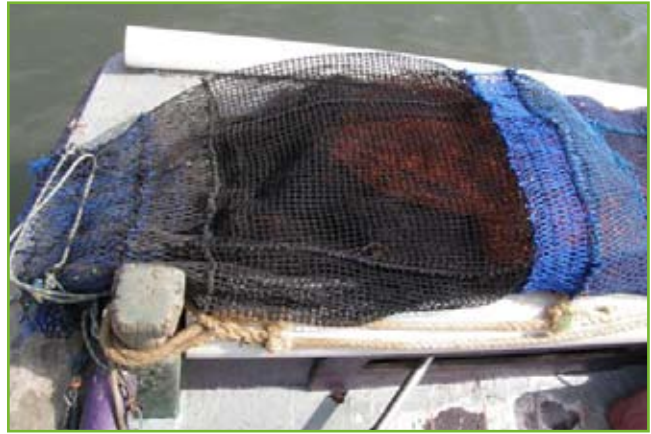
Investigate what are all the main landuses in your catchment; what are the main inputs and outputs of human activity in your catchment; what changes would need to be made to make your catchment sustainable?

Further Reading and Additional Information

Allen, R., UNEP, IUCN & WWF (1980) How to save the world : strategy for world conservation.

Australian DHAE (1982) National Conservation Strategy for Australia. Australian Department of Home Affairs and Environment, Canberra.

IUCN (and others) (1980) World Conservation Strategy: Living Resource Conservation for Sustainable Development. IUCN, Gland, Switzerland.



One type of bycatch reduction device (BRD) which is used by many prawn trawl fishing boats is the square mesh codend (part of the net where the catch collects). The square shape of the mesh means it remains open when it is full, allowing juvenile prawns and fish to escape. Source: OceanWatch Australia



Clean beaches and estuaries in a healthy catchment with minimal development, Mid North Coast NSW, source: OceanWatch Australia



Poor water quality with high nutrient levels, source: OceanWatch Australia