

# The Northern Crisis— Soil Erosion



Soil Conservation Service of N.S.W.

## Foreword

The Hon. J. R. Hallam, M.L.C.  
Minister for Agriculture

*The slopes and plains of northern New South Wales contain some of the richest cropping land in Australia, and produce much of the wheat, cotton and sorghum grown each year in this State.*

*The richness and fertility of the area is being lost or wasted as a result of soil erosion. The heavy summer storms falling on unprotected and vulnerable soil strip the topsoil and carve deep channels through the fallowed paddocks.*

*For landholders this soil erosion can mean loss of crops, yield and quality reduction, destruction of fences, water storages or buildings and increasingly difficult farming conditions. Shire councils and other government agencies must budget large sums of money each year to repair roads, rail lines, bridges, culverts and other facilities. The physical damage costs money now, while the lost soil fertility and wastage of the soil resource itself will have repercussions well into the next century.*

***The problem will only be solved by landholders and the community at large.***

*There must be a change in attitude towards the land and land use. Land is only ever held in trust for coming generations. The short term profits enjoyed today will not feed or clothe our grandchildren. To paraphrase an old Asian saying:*

*We should live as if we'll die tomorrow  
But farm as if we'll farm forever.*

**Cover Photo:** Soil erosion on arable land is a creeping disease that is stripping the valuable topsoil at a rate faster than new soil is being formed.

## ***Crisis? What Crisis?***

### *The Crisis is Rampant Accelerating Soil Erosion.*

- the loss of the irreplaceable topsoil of some of the most valuable and productive land in New South Wales.
- the loss of soil fertility, and a breakdown in soil structure.
- pollution of streams, and siltation of water storages.
- damage to roads, rail lines and other utilities.
- increased costs of production and reduced incomes for landholders.
- increased expenditures by shire councils and government departments.
- ultimately higher food costs and higher levels of rates and taxes for the people of New South Wales.
- the *destruction of our most important resource*, and the inheritance for future Australians.

**Accelerated soil erosion is now by far the most important environmental problem affecting the northern slopes and plains of New South Wales.**

*The soil erosion crisis has largely been caused by changes in landuse and land management.*





## ***Causes of the Crisis***

Each year, heavy rain storms sweep across the slopes and plains of northern New South Wales, especially during the summer months of December, January, and February. These storms drench small sections of the countryside with heavy rain in short periods of time.

Two hundred years ago this rain fell on a relatively undisturbed environment. Flat and undulating country supported open woodland or grassland, while the ridges and rocky outcrops were fully timbered. Runoff from storms was usually slow as the vegetation intercepted the raindrops, and there was high infiltration into the undisturbed soil profile. Erosion only became serious in time of drought or after wildfires when large areas were bare of vegetation.

Soil erosion is a natural process, balanced, in an undisturbed system, by soil formation. It is only when there is more erosion than soil formation that there is a problem.

The first European explorers reached the northern slopes and plains in the early 1800's and were quickly followed by settlers with sheep and cattle.

Initial clearing and subsequent continued cultivation reduced the vegetative cover, causing a loss of soil stability and the destruction of many stable, natural drainage lines. Rain now falls on large areas of unprotected soil. The resultant increased runoff flows at a higher velocity over the bare surface causing massive soil erosion, silt deposition and flooding.

In the last twenty years the problem has worsened as more land is being cleared for cropping. At the same time land is being cropped more often with an increasing area being sown each year to summer crops. Therefore more land is vulnerable to the erosive power of the summer storms.

## ***The Effects of the Erosion Crisis***

### *For the Landholder*

Sheet erosion, by removing thin layers of topsoil has, in some areas, decreased wheat yield by up to 30 per cent, and also lowered the quality of the crops produced.

Silt movement has at times totally buried crops or left land unworkable, again occasioning a crop loss. Replacement of damaged fences, farm roads or damaged earthworks are other direct costs of erosion that must be borne by affected landholders.

Farmers who attempt to protect their properties may spend up to \$100/ha for the construction of earthworks and other erosion control measures.

*Fallowed land is literally carved up and carted away by runoff. A heavy storm can remove topsoil down to the plough pan, reducing or destroying future productivity.*





## *For the Community*

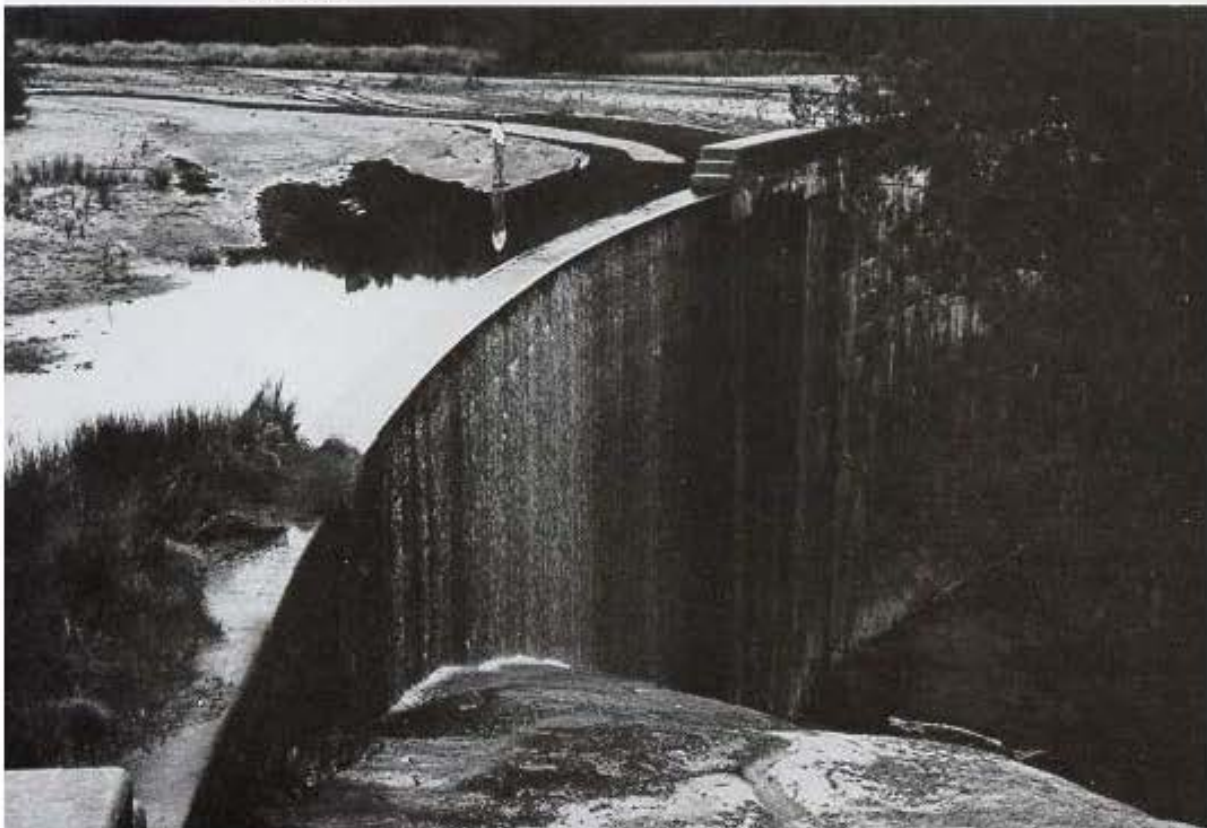
Local shires spend large sums each year throughout the State restoring roads to trafficable condition following damage caused by erosion and flooding. Silt deposition chokes the road drainage system, gullies dissect roads and low lying sections of roadway require resheeting.

The State Rail Authority also faces huge repair costs due to washaways of railway embankments and severe gully erosion and siltation affecting rail lines and culverts.

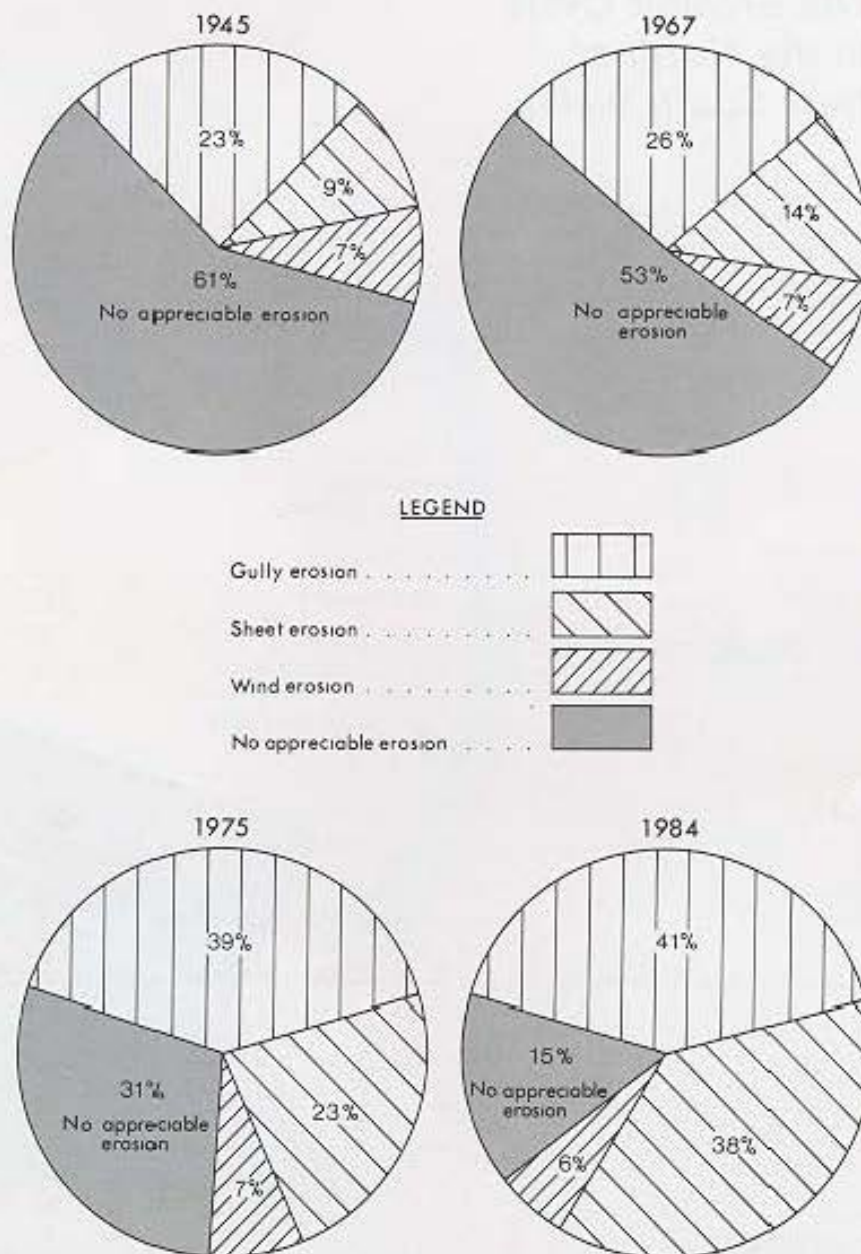
Telecom Australia encounters problems in maintaining communications to rural areas. Underground cables may be exposed by gully erosion, and sheet erosion reduces the depth of soil cover over cables so that they may be damaged by cultivation. Breakage and damage to cables may also occur at creek crossings due to stream bank erosion.

Soil is our most basic and important resource. Abundant fertile soil is the key to life; it is the ultimate source of our food, timber and wool. Without determined action, we will lose that resource and additionally, cause irreversible environmental damage.

*Erosion in the catchment caused complete siltation of this major water supply dam near Werris Creek. Many water storages throughout New South Wales are similarly threatened; strict catchment protection measures are necessary to ensure adequate supplies of clean water.*



## Increases in Soil Erosion in the Lower Namoi Catchment from 1945-1984



The lower Namoi catchment, containing the districts of Coonabarabran, Gunnedah, Narrabri and Quirindi, has undergone major changes in landuse in recent years. As a result, soil erosion is now a far worse problem than it has ever been.



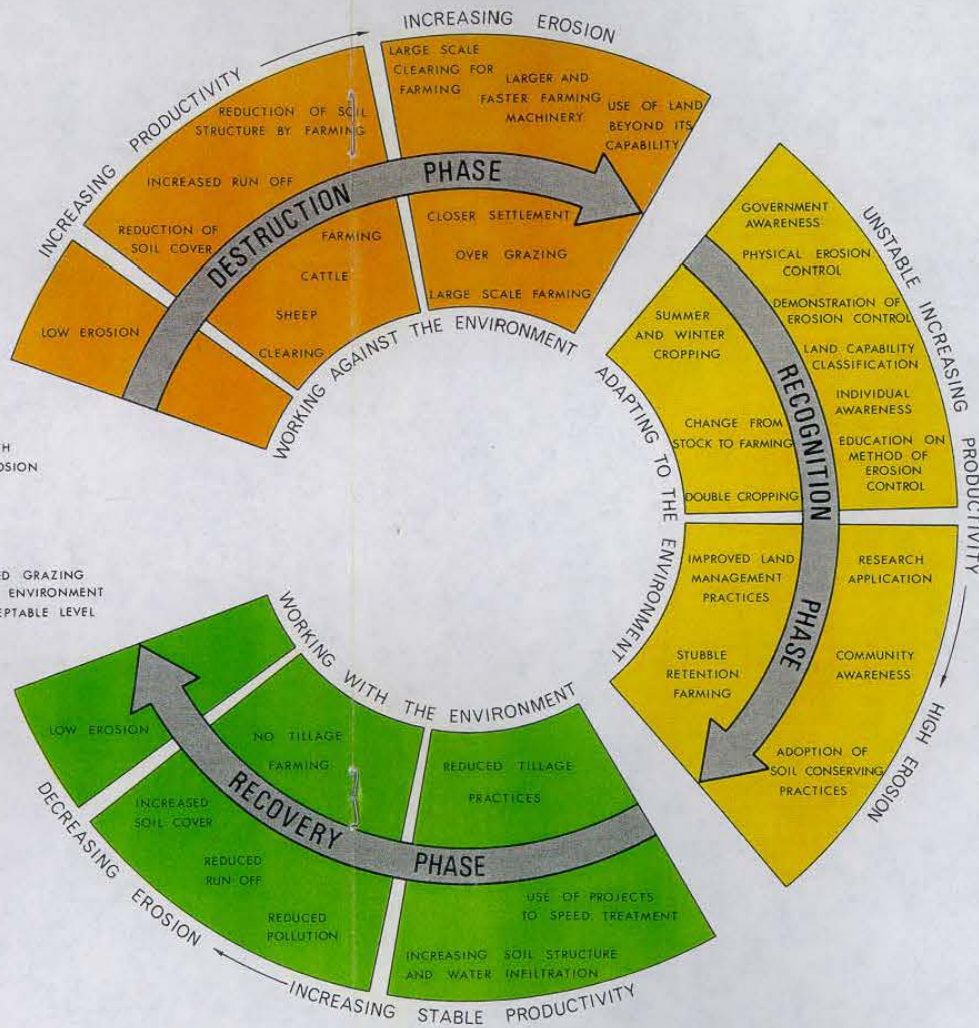
### The Erosion Cycle in the North of New South Wales

START 1800

STABLE CLIMAX VEGETATION WITH GEOLOGICAL EROSION RATES

OBJECTIVE 2000

STABLE VEGETATED GRAZING AND CROPPING ENVIRONMENT WITH LOW ACCEPTABLE LEVEL OF EROSION





## ***The Solution***

**THE COMMUNITY AS A WHOLE MUST BECOME AWARE THAT THE CRISIS DOES EXIST, AND ACT TO REDUCE ITS IMPACT.**

*The answer to the problem is effective soil conservation:*

- increased conservation farming such as stubble retention, reduced tillage and strip cropping where necessary.
- use of structural works such as graded banks where necessary.
- maintenance of good soil structure and fertility through optimal not maximal use of land.
- better land use decision making.
- greater forward planning.
- joint schemes where all affected landholders and agencies cooperate to solve a common problem.
- adoption of new techniques and machinery to reduce the impact of farming the land.
- an increasing understanding of and respect for the land and acceptance of our individual and joint responsibility for its continued health and productivity.

*Soil erosion is a community problem; repairs to roads, bridges, rail links and underground cables are ultimately paid for by the general community.*





*Silt deposition on cropping land causes damage to fences, tracks, buildings and water storages; crop loss; waterlogging.*

**Without effective community awareness, support and involvement, the crisis will remain with frightening consequences.**

**We are, all of us, paying for the erosion crisis now** through rates and taxes, and also through flow-on costs, via increased food and goods prices.

**We will, all of us, continue paying for the crisis** through reduced farm yields, wastage of land and damage to vital utilities.

**Soil Erosion** is increasing at a faster rate than it can be treated. We should not allow the situation to reach the point of no return where damaged land is surrendered and becomes non-productive wasteland.

The northern slopes and plains of New South Wales are a vitally important resource to be protected so that they remain highly productive. We cannot through neglect allow this land to become a degraded, denuded, eroded wasteland.

**THE EROSION CRISIS IS NOW.**

**ACTION IS NEEDED NOW.**

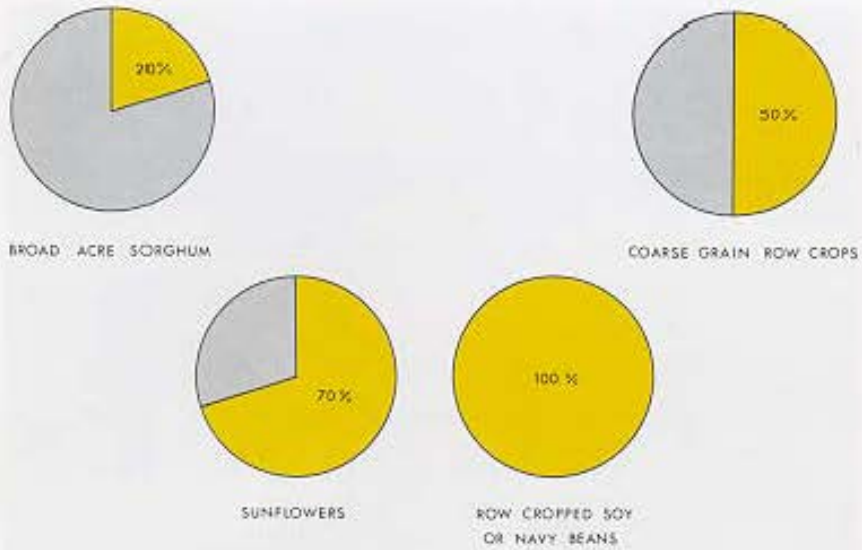
What isn't done now will leave a legacy of terrible proportions for which future generations will not thank us.



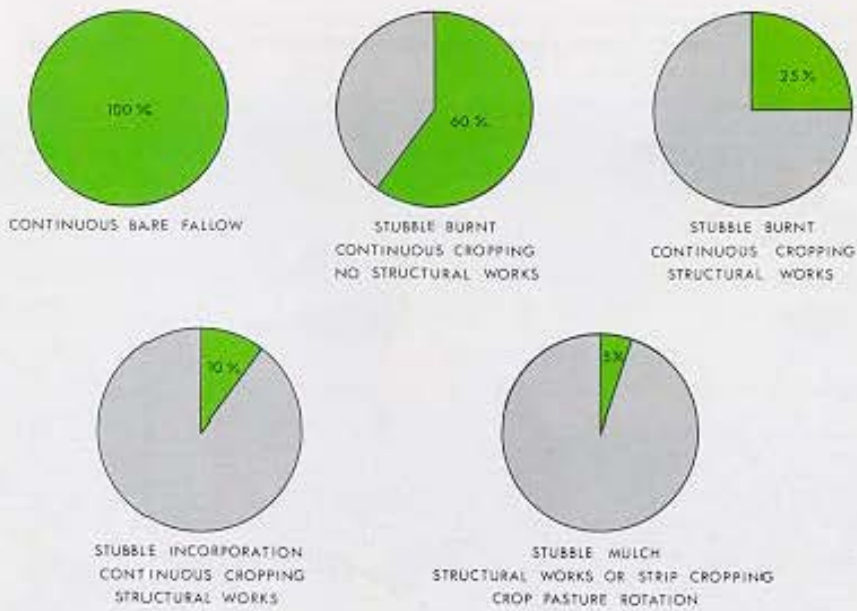


*Soil conservation on an individual property or on a number of adjoining properties aims to protect land so that it can be used to full capacity over the long term.*





PERCENTAGE INCREASE IN EROSION RELATIVE TO WINTER CEREAL CROP FOR SELECTED SUMMER CROPS



SOIL LOSS AS A PERCENTAGE OF THAT LOST UNDER CONTINUOUS BARE FALLOW SYSTEMS





*Strip cropping is a management technique designed to combat water erosion on very gently sloping country. Strips of growing crop or stubble, laid out at right angles to the water flow, slow the water and reduce its erosive power before it flows across fallowed land.*

*Stubble retention and conservation tillage are increasing in popularity throughout the north for a number of reasons: reduced soil erosion, improved soil fertility and structure, reduced fuel consumption as fewer cultivations are needed.*

