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Ministry for the Environment
Sustainable Land Management:
A Strategy for New Zealand
1996 June

Sustainable Land Management

A Strategy for New Zealand

MINISTRY FOR THE ENVIRONMENT
MANATU MO TE TAIAO

Ministry for the Environment



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Foreword

New Zealand's economy is largely an agricultural one. More than two-thirds of our land area is used for agricultural purposes. It is therefore inevitable that agriculture's impact on the environment is a significant one. These impacts are not new and they have been gradual. Unfortunately many have resulted in serious problems such as erosion, soil compaction, loss of soil fertility, sedimentation and pollution of our waterways. It is increasingly apparent that the primary production which has sustained our country for generations has not come without a cost to the environment.

Many New Zealanders are increasingly concerned about the sort of country their children and grandchildren will inherit. Overseas consumers too, are becoming more and more concerned about how the products they consume are produced.

New Zealand is increasingly trading on a clean, green image. We should not underestimate the importance of the latter. We have to ask ourselves, how we are going to justify the claims. Who is going to give the guarantees and make good the image?

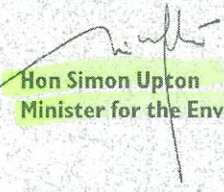
I am of the view that the only people who can make real progress on sustainable land management are the people in the front line - the farmers, the land users, the land owners. Unless these people are behind the proposed solutions, New Zealand will not make much progress.

Clearly, both local and central government have a role to play too. This starts with research. The Government is already spending \$80 million a year on research into problems related to land management. The bad practices of the past carry a heavy price tag today!

The Government is committed to increasing expenditure on research. This research must be turned into practical tools and guidelines for sustainable land management. Then we have to communicate this information to the land users. This is where the Landcare Trust comes into play. This body will establish and support Landcare Groups made up of land users and owners working together. This is important. Land management problems don't start and stop on a single property - they run across boundaries. Everybody has to be involved - local and central government, farmers, land owners and users.

This Sustainable Land Management Strategy is a low-key, grass roots solution. It is designed to see that the Resource Management Act will work for land users, rather than against them. Sustainable land management is important for both New Zealand's economy and environment. For these reasons it is of vital importance to our rural communities. Their involvement in the Sustainable Land Management Strategy is therefore crucial both to their survival and success.




Hon Simon Upton
Minister for the Environment

Contents

1 Introduction	3
2 The Importance of Sustainable Land Management	3
3 Desired Outcomes	5
4 Priorities for Action	6
High Country Degradation	6
Agricultural Impacts on Aquatic Eco-systems	6
Hill Country Erosion	7
Other Issues	7
5 Policy Approach	8
Principles	8
Linkages	9
Priorities	9
6 The Solutions	9
Direct Help to Land Users	10
1 Establishment of a national Landcare Trust	10
2 Preparation of best management practice guidelines	10
3 Provision of advisory services	10
Support Systems	11
1 Research and information	11
2 Regulation	11
3 Development of market incentives	12
4 Co-ordination	14
7 Monitoring and Review	15
8 Implementation	16
Figure 1. Proposed Administrative Structure for Co-ordination	14

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Sustainable Land Management Strategy

I Introduction

Land use in New Zealand over the last 150 years has resulted in significant, and sometimes severe, environmental problems. Given that around two-thirds of our land is used for agriculture and forestry, it is hardly surprising there are biological and physical impacts that are of national significance. Agriculture and forestry make up 69 percent of total exports worth over \$13 billion per year and because of this, unsustainable land management has far-reaching effects on our economy and way of life.

Environment 2010 stated that the Government will give priority to developing and implementing a Sustainable Land Management Strategy for New Zealand. The purpose of the Strategy is to enable land users, and those who provide support and services to land users, to work together more effectively.

The Strategy defines the problem, sets out the priorities for action and states the outcomes that the Government seeks. It then describes what the Government can do to assist land users directly to improve land use practices, and what it can do by improving the support systems which underpin land management practice. The Strategy recognises and is designed to complement, assist and strengthen the sustainable land management initiatives which regional councils have already undertaken as they exercise their responsibilities under the Resource Management Act.

The focal point for the Strategy is the land user. The Strategy promotes the encouragement of land users to continually improve and, in doing so, to incorporate the effects their businesses have on the environment. This is to be done in two ways. First, by providing advice and support for actions land users can undertake themselves and, second, by co-ordinating support systems such as research and the transfer of information to land users and others.

The Strategy provides a national framework and statement of what the Government intends to do to encourage environmental improvements on commercially-used land. The Government's initiatives are only part of the picture. Initiatives by industry sectors, local government and land users themselves will be crucial to achieving the long term and permanent changes needed for sustainable environmental management.

2 The Importance of Sustainable Land Management

New Zealand has a history of land management that has resulted in soil erosion; silted-up streams, rivers and estuaries; algal blooms and dense growth of aquatic weeds resulting from nutrient-rich runoff. In some locations, declining levels of soil fertility and organic matter and increasing soil acidification have been apparent for some time. But they have not always been recognised as matters of concern. It could be argued that these are the result of the pursuit of economic and social goals without due regard to environmental needs.

In recent years issues such as contamination of groundwater, loss of soil structure, chemical contamination and soil compaction have required increased attention. Intensified

production places additional pressure on high quality soils in horticultural and arable areas. The effects of pests and weeds, and the pressures for urban expansion are also important issues. Our knowledge of the processes at work and responses to their effects have been patchy and often unco-ordinated. Unless these issues are addressed in a more systematic way, underpinned by effective science, we put at risk a large part of our export income, and jeopardise the well-being of future generations of New Zealanders.

Many land management issues have been resolved by changing technology and management practices. Considerable progress has been made in achieving more sustainable land production. While much has been achieved, some significant problems still have to be resolved. This is particularly so for the North Island hill country and the South Island high country. Pastoral land use is threatened in parts of the South Island high country because of over-grazing, burning, and pests. Land degradation, weeds and pests are also serious issues for many other areas of New Zealand.

Between 1986 and 1990, natural disasters and adverse climatic events cost the country more than \$175 million in direct assistance to primary producers. The costs to individual businesses and to communities were considerably greater. Protected areas, especially forests and wetlands, play an important role in limiting vulnerability to flooding, erosion and other damage.

Land management problems are compounded by the unique geological history of New Zealand. Much of the land is mountainous and still undergoing significant uplift. Land-slopes are close to the maximum. Many areas are underlain by soft, erodible materials. All this makes many parts of the country prone to erosion. The removal of native bush and destruction of other eco-systems have significantly increased erosion rates. About ten percent of New Zealand is classed as severely eroded and the estimated loss of soil through erosion and transport by rivers to the sea is estimated to be 400 million tonnes per year. Voluntary and government-subsidised soil conservation programmes over the last few decades have achieved only a localised reduction in soil erosion on hill country farmlands.

Land management practices have also affected both ground and surface waters. Though waterways in sparsely developed areas of New Zealand are in good condition, lowland river reaches in agriculturally developed catchments are in surprisingly poor condition. Some small creeks and streams in dairying areas are in very poor condition, the result of many agriculturally-generated effluent and waste inputs.

Nitrate contamination of shallow groundwater is an important issue in some intensively used catchments in New Zealand. It has also been found that lakes fed by catchments in which more than 50 percent of the land is used for agriculture show symptoms of eutrophication.

Less tangible, but no less important, are the ecological, cultural, historical and traditional values associated with the land. As a natural eco-system, the New Zealand landscape is home to a unique array of birds, plants, and other biota. It is this landscape that local recreationalists and tourists come to visit and enjoy.

Maori have a strong affinity with land and water. The health or mauri of a tribal river or lake is a cornerstone to the mana of an iwi. Often iwi have significant river systems in agricultural catchments which are affected by point source discharges and diffuse

sources of agricultural run-off. The desecration of waahi tapu, urupa and other sites of significance through land development or land degradation is also of primary concern to iwi.

New Zealand makes strong statements about its environmental status. Our reputation for "quality products from a quality environment" depends on environmentally sustainable land use practices. If we are to seize opportunities to sell new and innovative products, we must improve technology, land management skills and understanding of land management issues. Sound land management is, increasingly, recognised as offering a competitive advantage. This is a particularly important consideration where we compete internationally with other producers of similar products.

Environmental impacts which result from past and current land management practices have proven difficult to address over the years because of the pervasive institutional problems that, cumulatively, resist much needed change. Much has been done by successive governments over the last ten years to address these institutional problems. They include legislative reform, such as the enactment of Resource Management Act 1991, local government reform in 1989 and economic reforms. These reforms have served New Zealand well. But we can and must do better. There are opportunities to build on these changes and improve our performance.

Some land users have made significant advances in the way that they operate their businesses to mitigate effects on the surrounding environment. However, many land users do not recognise the problems they face. Land users often have inadequate tools or information to make changes. Furthermore, the research, advisory and regulatory systems of central and local government are not adequately co-ordinated or targeted.

Sustainable land management will not be achieved unless each and every individual land user feels a sense of responsibility for it. Policy should therefore seek primarily to strengthen the responsibility and accountability of individual land users. However, there are a number of ways in which landowners can be assisted to meet their responsibilities, and to ensure that the actions necessary for sustainability are taken by all land users and not by just a few.

3 Desired Outcomes

The desired outcomes for sustainable land management which the Government has identified are:

- Maintenance of the potential of New Zealand soils for a range of uses for present and future generations;
- The adoption of land management skills and the application of appropriate technologies to enable individuals and communities to provide for their social and economic well-being;
- The adoption of management practices that maintain or enhance the quality of groundwater resources, coastal waters and waterways regarding harmful micro-organisms and other contaminants, suspended sediments and nutrients;
- The avoidance, mitigation, and remediation of the impacts of land-related hazards, including flooding, subsidence and erosion;

- The maintenance of catchments to provide high quality water resources for downstream users and for users of coastal spaces (intertidal areas, seabed, water);
- The maintenance of cultural values associated with land and water, including the relationship of Maori and their traditions with their ancestral lands, water sites, waahi tapu, and other taonga; and
- The maintenance of aesthetic, ecological and conservation values related to land and water.

4 Priorities for action

Many land uses have potentially adverse impacts on the environment. Some of these impacts are relatively localised or can be addressed at a regional or local level. Other effects are more difficult to address, or are attributable to land practices common in many parts of the country.

The Government has identified priority areas for action to help significant progress towards the promotion of sustainable land management. These priorities were selected on the basis of the following:

- The distribution of the impacts, such as impacts which affect large areas of the country;
- The nature of the impacts, such as those which are long term or potentially irreversible;
- Their economic and social significance; and
- The extent to which central government can usefully do something about the impacts.

Using these criteria, the following three priorities were identified:

High Country Degradation: There has been significant eco-system failure over some parts of the high country, including the depletion of nutrients and organic matter and loss of indigenous biodiversity. The main threats relate to over-grazing and tussock burning, and the encroachment of weeds (eg, *Hieracium*) and pests (especially rabbits). Many of these impacts are potentially irreversible. The main factors contributing to the situation include community attitudes, investment regimes and government policies which have encouraged unsustainable increases in productivity, as well as the system of land tenure under the Land Act 1948.

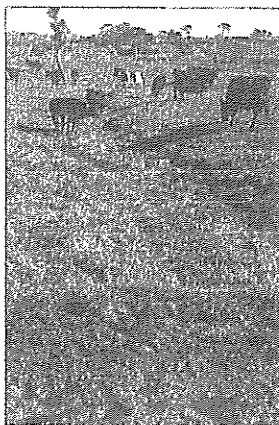


High country grazing in Marlborough.

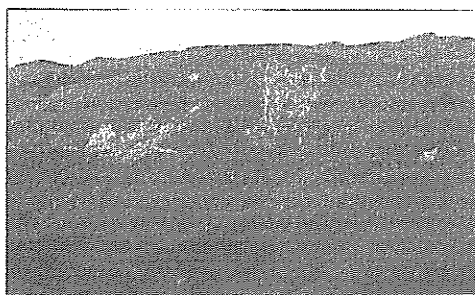
Agricultural Impacts on Aquatic Eco-systems: Non-point discharges are the main source of pollution in both ground and surface waters. Impacts are pervasive, extending from Northland to Southland, and tend to be greatest where farming is most intensive, such as the dairying, cropping and market gardening areas. Many impacts

are effectively irreversible, such as lake eutrophication. The economic value of water resources has been estimated at many hundreds of millions of dollars annually, much of which is potentially at risk from non-point source pollution. Non-point source pollution is more difficult to control than point source discharges (such as dairy shed wastes) and is not readily addressed using traditional regulatory means which are successfully controlling point source discharges to water.

Hill Country Erosion: Particular problems occur in erodible mudstone or sandstone hill country such as in eastern Taranaki, the Wanganui catchment, Rangitikei, the east coast of the North Island and pastoral land developed on loessal soils such as those found in Marlborough. Other problem areas include the volcanic plateau of the central North Island and the western region of the King Country.



Dairying in the Waikato.



Slip erosion in the Wairarapa.

On-farm earthflows, soil slip and gully formations seriously impair the viability and productivity of farms in erosion-prone areas. After hill country slip erosion, for example, pasture production takes approximately 20 years to recover to within 70 to 80 percent of its pre-erosion levels. Downstream, erosional debris causes rivers to aggrade, with consequential increases in risks to flooding. Erosion can also contribute to many of the water quality problems

such as loss of aquatic habitat and increased sediment loads.

Other Issues: Many other land use issues have been identified, but these are either:

- Emerging issues which are not fully understood (eg. urban run-off); or
- Of local or regional significance (eg. soil compaction); or
- More appropriately dealt with in other fora (eg. contaminated sites); or
- Related issues (eg. pest management).

While it is recognised that these issues are important and need to be addressed, the primary focus of the Strategy is on productive land use activities with particular emphasis on agricultural impacts on aquatic eco-systems, hill country erosion and the high country. This does not mean that other land use issues cannot be addressed through the Strategy. They can, because the Strategy provides a pathway to address national and regional priorities in sustainable land management.

The linkage to biodiversity is especially important. Many of the issues addressed in this Strategy will help improve biodiversity on land outside the conservation estate. The Government is currently developing a strategy for biodiversity that will integrate with and complement this Strategy.

5 Policy Approach

There is insufficient understanding of the complex interaction of the biophysical and socio-economic systems to justify and implement widespread regulatory measures at this stage.

Voluntary actions by land users to carry out better land management practices are considered at this time to be the best way to achieve the environmental improvements required. However, voluntary initiatives must be based on good information on the physical and biological characteristics of the land and surrounding environment. Good information requires good research.

Coupled with this, monitoring systems and environmental indicators must be devised for use by land users so they know what is actually happening to the land and can review their progress against clear benchmarks. Self-monitoring systems are the way to do this. Some are currently being developed and trialled.

Using regulatory means alone to force land users to change land management practices is fraught with difficulty. Costs to enforcement agencies would be very high and many regulations would be difficult to enforce.

The major emphasis of the Strategy is on providing information and support in a form that will encourage land users to change unsustainable land use practices. In parallel with this, the Government will develop and improve existing support systems such as environmental indicators, research, new policy tools, market incentives and regulations. Particular emphasis will be placed over the next few years on developing a set of national indicators and on-site indicators for sustainable land management.

Principles

The Government seeks improved outcomes in sustainable land management through applying the following principles.

- The primary responsibility for achieving sustainable land management rests with individual users. *This is the key principle of the Strategy.*
- As soon as reasonably practicable, land management needs to become ecologically sustainable, with economic and social goals reflecting this.
- Land management decisions must recognise the biological and physical characteristics and limits of the ecological systems which underpin land as a resource.
- Land management must take into account climatic risks and scientific uncertainty concerning the characteristics and limits of these ecological systems.
- The Government will exercise its powers to ensure that sustainable property rights and duties are clearly specified, monitored and enforced in such a way that market incentives promote sustainable land management.
- Reliance on voluntary actions by landowners will be preferred where there is good reason to believe these will achieve the desired outcomes in reasonable time, or where regulatory alternatives are impractical at the present time.

The Sustainable Land Management Strategy is built on the principles of continual improvement, voluntary actions by land managers and making relevant information accessible so changes can take place.

Better land management practices can be carried out only by individual land users. However, because so many land users are involved in addressing any one issue, partnerships among the key stakeholders and other interests are vital if effective progress towards sustainable land management is to be made. The alternative is hierarchical and/or bureaucratic chains of command with the consequential transaction costs.

Significant progress must be made towards sustainable land management in the next ten to fifteen years. This will avoid the cost and disruption of more direct intervention which may be demanded by the community to arrest land use problems. Unless there is clear evidence of progress, there are likely to be calls for more direct regulatory or tax-related intervention.

Linkages

The Strategy does not start from zero. Rather, it is intended that it build on the economic and structural reforms of the last ten years. These include, for example, the removal of subsidies and tariff protection, the Resource Management Act, the Biosecurity Act, and the many local and regional land use initiatives already underway. The Strategy will provide coherence to current work programmes, identify the gaps and enable government departments, local government and industry to better focus and co-ordinate their budgets and to plan their programmes. This, in turn, will support land owners and managers in the improvement of their environmental and economic performance.

The Strategy aims to avoid inconsistencies and overlapping work programmes between stakeholders and regions and the inherent inefficiencies brought about by duplication of effort in this field. Without a Strategy, it is likely that the required work will not be undertaken or undertaken only in a piecemeal fashion.

Priorities

The Strategy will focus its efforts and gain measurable progress on the three priority areas identified in Section 4 of this document. At the same time, the Strategy will provide the framework for other parties to work on regional, local or sector issues. The priority areas will be addressed through the development of Action Plans developed in co-operation with and agreed by major stakeholders. Considerable progress has already been made on an Action Plan to address agricultural impacts on aquatic ecosystems. Work on an Action Plan for the South Island high country has also commenced.

6 The Solutions

There are two principal ways in which sustainable land management can be promoted. They are:

- Direct help to land users to achieve desired changes; and
- Indirect assistance by improving research, co-ordination and other support from the Government and industry.

The principal activities which the Government will undertake in each of these areas are outlined below.

Direct Help to Land Users

1 Establishment of a national Landcare Trust

One of the most effective ways of achieving changes to land use practices is through local community groups, such as Landcare groups. Facilitating and motivating such groups is a skilled process.

The Ministries of Agriculture and Forestry have existing facilitation programmes which are promoting sustainable land management. Many regional councils also have successful facilitation programmes. However, to advance these initiatives, the Government considers that the farming industry and community need to play a more direct role.

Federated Farmers has recognised this, and in conjunction with national environmental and recreational groups, has proposed the establishment of a Landcare Trust. The Trust will train a national network of Landcare and community group facilitators and encourage the establishment of Landcare groups. In addition, Women's Division of Federated Farmers has recently prepared a guide to assist Landcare groups at all stages of development.

The Government will provide financial support to the proposed Landcare Trust to train facilitators to encourage and support the establishment of landcare groups.

2 Preparation of best management practice guidelines

In many situations it is not a lack of scientific knowledge on sustainable land management practices that is delaying change: the delay is in the translation of scientific principles and theory into practical, on-ground techniques that can be readily implemented by land users. In other situations it is the lack of a demonstrated model of the success of a technique or technology. It is pointless to compel land users to adopt practices about which they have no information.

The provision of information (particularly on the nature of the impacts of current land management practices and how these affect others and the environment) in itself can encourage land users to adopt better practices. This can be advanced through biophysical and financial decision support systems, including computer programmes such as STOCKPOL. The Sustainable Management Fund administered through the Ministry for the Environment, will continue to be used to support trials and demonstrations of this type.

The Government, through the Ministry for the Environment, Ministry of Agriculture and other departments, industry sectors and councils will prepare information kits and guidelines to advance sustainable land management practices in practical, useful ways.

3 Provision of advisory services

Land users must make decisions about a range of financial, market and environmental risks. Key planning advisers include not only business and financial advisers, farm

management consultants, and producer boards, but also regional councils and research agencies.

The physical and biological characteristics of the land and surrounding environment must be well understood. This requires a range of skills, methods, and technology, which are generally obtained from neighbours, the wider community, product suppliers and sector groups. These people rely on agencies such as the Ministries of Agriculture and Forestry, regional councils and research agencies to provide the knowledge and information. The links and co-ordination among some of these groups is not well-developed. Information and advisory services can be improved by ensuring that the target audience is being reached (eg, through market surveys), and assessing the best means by which information can be delivered.

The Government, through the Ministry for the Environment, Ministry of Agriculture and other government departments, will work with local government and private sector advisers to incorporate best practice approaches which advance sustainable management of land.

Support Systems

1 Research and Information

It is generally agreed that research on sustainable land management needs to be co-ordinated and focused on areas of need, and the results better disseminated to the target audience.

The Government proposes that a National Science Strategy Committee (NSS) be established by the Ministry of Research, Science and Technology to co-ordinate, where possible, both publicly and privately funded sustainable land management research at a regional and a national level. This NSS Committee would allow for consultation, participation and partnerships between all the stakeholders in determining research priorities in sustainable land management, with results communicated in a way most easily understood and available to the particular group of end users. The Government also sees industry and regional councils playing a more important role in funding research themselves.

The Government will establish a National Science Strategy Committee to co-ordinate publicly and privately funded sustainable land management research at a regional and a national level.

The Ministry for the Environment will prepare and regularly update a national network of practitioners and directory of "who's doing what in sustainable land management".

2 Regulation

Legislation provides the legal framework for controls that avoid, remedy or mitigate adverse effects on the environment. The most important legislation in this regard is the Resource Management Act 1991 and the Biosecurity Act 1993 (in relation to pest man-

agement). Legislative reform can also remove barriers to sustainable land use (eg, high country reform) and can improve the way that particular land use practices are carried out (eg, pesticide use).

At regional and local levels, legislation provides local authorities with important powers to control the actions of land users, primarily through the use of rules in plans and pest management strategies. In addition, local authorities are able to impose charges and costs on land owners to achieve sustainable land management outcomes. Local government performance can be enhanced through greater co-operation and consistency between regions and districts.

Law and regulation provide certainty to land users on what they can and cannot do on land. Water permits over the past 25 years have effectively controlled point source discharges because these can be related back to the actions of individuals. However, regulatory controls, particularly in relation to non-point sources of pollution, are difficult to devise and are expensive to monitor and enforce. For regulatory measures to be successful, regulations need to be workable, practical and make sense to those who have to comply with them.

It is therefore important that the Government ensures that its legislation is implemented in a consistent manner throughout the country.

The Government will complete the legislative framework, especially the Crown Pastoral Land Bill, the Hazardous Substances and New Organisms Bill, and the Agricultural Compounds Bill.

MfE will develop more clearly specified Government outcome statements and guidelines for the three priority areas (the option of a national policy statement under the Resource Management Act will be kept open at this stage).

MfE will continue to make selected submissions on regional and district plans to encourage effective and efficient initiatives by councils to bring about sustainable land management.

MfE will continue to develop guidelines on new approaches to resource management under the RM Act and the concept of integrated management.

MfE will develop guidelines or standards for water quality and soil characteristics, and encourage regional councils to adopt these for important catchments.

3 Development of market incentives

There is a range of approaches that need enhancement, development and promotion, such as the application of market incentives and other economic instruments. These mechanisms are often best developed at a national level and promoted in conjunction with industry.

The Government is seeking to promote an integrated package of voluntary measures to maximise market incentives for sustainable land management. The first stage is to employ management systems which monitor environmental performance from the land user to the market. The second stage is to develop codes of practice to establish volun-

ence standards and to promote continual improvement through cleaner initiatives. This can be linked to the market through credible eco-labels. Industries are then in a position to offer improved market access and products from sustainable land management systems.

and insurance industry can also play an important role in providing incentives for land use risks and financial risk management together.

Government will support the development of industry initiatives by:
- promoting with industry sectors a coherent package that enhances the
- positive market signals, including:
- environmental management systems from land to market
- codes of practice and performance standards
- robust eco-labels.

promoting, with bankers and the insurance industry, financial risk management that takes account of sustainable land management.

Co-ordination (refer Figure 1)

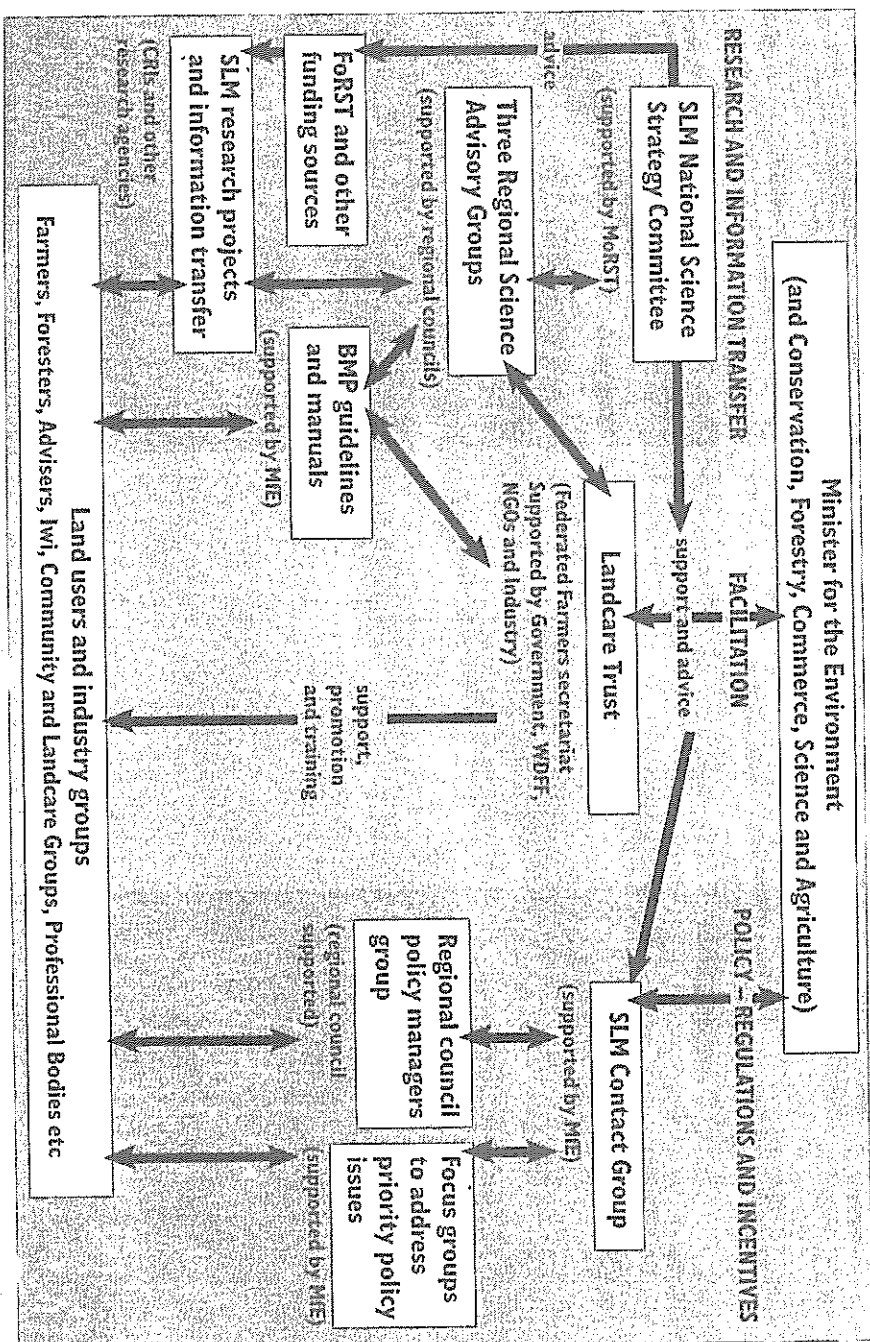
Government's role in achieving the desired outcomes in sustainable land management is to provide strong leadership and direction, particularly in research and co-ordinating the development of systems that deliver easily accessible quality information to land users and policy makers. Some new initiatives have been outlined above; a number of initiatives have already been taken to improve policy co-ordination. The relationship of these groups is illustrated in Figure 1 and summarised below.

Regional Council Policy Managers Forum has recently been established to review approaches taken by councils in their preparation of policies and plans under the Resource Management Act. This group could be the forum and conduit of professional advice to industry on inter-regional resource management issues which require a co-ordinated approach.

Special purpose Focus Groups will be convened to address specific policy or technical issues related to sustainable land management. The Focus Groups will be task oriented, have specific terms of reference related to the task, and will be disbanded once the work has been completed. Likely tasks include the development of Action Plans for priority problems, specific standards or guidelines for sustainable land management, new tools (such as market incentives), and indicators of the sustainability of land use. Few Focus Groups will operate at any one time. These Groups will be convened and led usually by the Ministry for the Environment, but other government agencies with specific interests could convene a Focus Group to address a sustainable land management issue. Where the outcome requires Government endorsement of a specific policy, this will be referred to the Contact Group (see below) for its advice.

The Minister for the Environment has established a **Contact Group** on Sustainable Land Management. The purpose of this Group is to act as a "litmus test" for the scope,

Figure 1: Proposed Administrative Structure for Co-ordination



appropriateness and practicality of the Government's proposals in the broad ambit of sustainable land management. The Group will provide advice to the Minister and maintain an overview of the development and implementation of this Strategy. Its membership will be reviewed to ensure that it is best able to provide appropriate advice to support this Strategy.

An **Officials Standing Committee** has been established to co-ordinate advice and departmental work programmes in relation to land management issues. It will have the specific task of monitoring and helping co-ordinate within central government the implementation of this Strategy.

7 Monitoring and Review

The purpose of a monitoring regime for the Sustainable Land Management Strategy is to ensure that tangible environmental results are achieved over time. The Ministry for the Environment will be primarily responsible and accountable for the establishment and implementation of a monitoring framework specifically tailored to the Strategy. There is a need for the consistent monitoring of national environmental outcomes, and hence a need for a core set of environmental indicators.

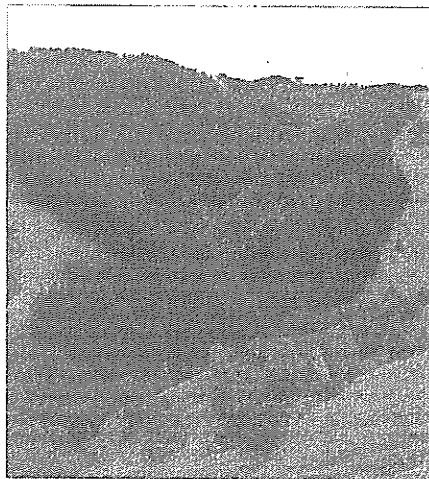
The monitoring programme for the Strategy will be linked to and build upon the Ministry for the Environment's Resource Management Act monitoring framework and its Framework for National Environmental Indicators. The monitoring regime will also build on other departmental monitoring programmes and information bases such as MAF's farm monitoring network, Statistics New Zealand surveys and the Ministry of Forestry's industry database.

The Strategy's monitoring programme will be reliant on information flows and formal reporting to the Contact Group on Sustainable Land Management by local government, industry, the proposed Landcare Trust and regional advisory groups.

Two distinctive areas of monitoring will be undertaken:

- First, monitoring environmental outcomes. This will be done under the Ministry for the Environment national environmental indicators programme.
- Second, monitoring the effectiveness and implementation of the Strategy. This will be done by reporting on the actions undertaken through the Strategy and by monitoring land user awareness and behavioural change.

The co-ordination mechanisms described in Figure 1 provide opportunities for ongoing re-evaluation of the Strategy. The Strategy will be reviewed after five years.



Mature tree plantings have halted expansion of a deep gully.

8 Implementation

Departments have a joint responsibility for ensuring that the Government's initiatives and programmes are in accordance with goals of the Strategy. The Ministry for the Environment has the lead responsibility for ensuring that systems are in place and for reporting progress. The Ministry will also consult with key stakeholders (industry groups and local government particularly) on the specific actions they can take which will help implement the Strategy, particularly in relation to the development of Action Plans.

The Ministry for the Environment will develop, in conjunction with stakeholders, Action Plans for the three priority areas: high country degradation; agricultural impacts on aquatic eco-systems; and hill country erosion.

